

Jorge M. Zuniga, Ph.D.

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3D Printed Prosthetic, Orthotic & Assistive Devices
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PRIMARY RESEARCH INTERESTS

- Biomechanics, motor control, neurophysiology, sensor technology, and 3D printed prosthetic, orthotic & assistive devices development and testing.

EDUCATION

- 2007- 2011 Ph.D. in Exercise Physiology, University of Nebraska-Lincoln.
- 2005-2007 Masters in Exercise Science, University of Nebraska at Omaha.
- 1999-2003 Pedagogy in Physical Education, Cardenal R. Silva Henrriquez Catholic University, Santiago, Chile.
- 1994-1997 Manuel Barros Borgono High School, Santiago, Chile.

EMPLOYMENT

- **August 2016 to Present:** Assistant Professor in the Department of Biomechanics, Biomechanics Research Building at the University of Nebraska at Omaha.
 - Research & development of 3D printed prosthetic, orthotic & assistive devices.
 - Undergraduate teaching: BMCH 4630 - 301 Biomechanics (Summer 2017)
 - Graduate teaching: BMCH 8410 and 9411 - Motor Control I (Fall 2017), BMCH 9510 - Motor Learning II (Spring 2019).
- **August 2012 to 2016:** Director of 3D Research & Innovation Laboratory Department of Exercise Science and Pre Health Professions at Creighton University.
 - Exercise Physiology (EXS 335), Exercise Physiology Laboratory (EXS 335 AA and BB), Nutrition for Health and Sport Performance (EXS 350), Nutrition for Health and Sport Performance ONLINE (EXS 350), Basic Statistics and Research Design (EXS 407), Directed Independent Research (EXS 497), Directed Independent Study (EXS 495), and Directed Independent Readings (EXS 493).
- **August 2011- May 2012:** Assistant Professor of Kinesiology at the School of Allied Health department of Kinesiology at Western New Mexico University.
 - Undergraduate Teaching: Anatomical and Physiological Kinesiology (with Lab) (KINS 240/242), Exercise Physiology (with Lab) (KINS 341/342), Exercise Prescription for Special Populations (KINS 440), Nutrition/Diet Therapy (KINS/WELL 300), Introduction to Research in Kinesiology (KINS 480).
 - Graduate Teaching: Exercise Programming and Prescription (KINS 550), and Advanced Research Seminar (KIN 551).
- **August 2007- July 2011:** Graduate Assistant in the Exercise Physiology Laboratory at the University of Nebraska-Lincoln.

- Graduate Teaching and Research Assistant / Laboratory Instructor – Department of Nutrition and Health Sciences, Physiology of Exercise (NUTR 484/884).

- Graduate Teaching and Research Assistant / Laboratory Instructor – Department of Nutrition and Health Sciences, Exercise Testing and Exercise Programming in Adult Fitness and Cardiac Rehabilitation (NUTR 486/886).

- **August 2005- May 2007:** Graduate Assistant in the Exercise Physiology Laboratory at the University of Nebraska at Omaha.
- **May 2006-March 2007:** Exercise Physiologist in the Physical Therapy department at the University of Nebraska Medical Center, Omaha, NE.
- **March 2002- November 2003:** Assistant in Exercise Physiology at Cardenal R. Siva Henrriquez Catholic University, Santiago, Chile.

PUBLICATIONS

Publication Summary Table

Status	First or Co-author	Total Number	Number of Students Co-authors
Submitted	First=2; Co= 4	6	8
Published	First=18; Co= 52	70	51
Rejected (not listed)	First=2; Co= 3	5	8
In Preparation	First=0; Co= 0	0	0
Total	First=22; Co= 59	81	67

March 19, 2018	All	Since 2013
Citations	924	762
h-index	18	15
i10-index	36	30

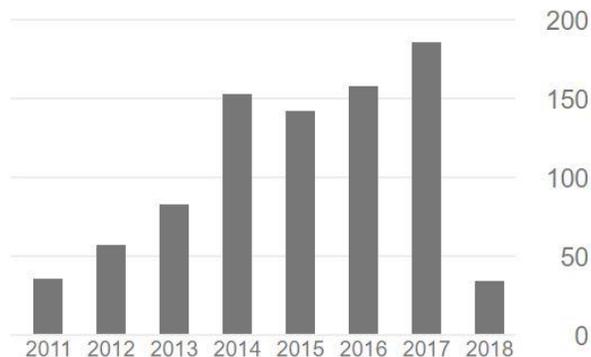


Figure 1. Citations metrics and h-index

Publication List by Year

2018

1. **Zuniga JM**, Major MJ, Peck J, Srivastava R, Pierce J., Stergiou N. Considerations for the Development of 3D Printed Upper-Limb Prostheses. O&P News Magazine of the American Orthotic and Prosthetic Association. Submitted March 16, 2018.
I performed about 90% effort in this manuscript. The work was funded with my grants. (Impact Factor: not available)
2. **Zuniga JM**, Major MJ, Peck J, Srivastava R, Pierce J., Stergiou N. Technical Considerations for the Development of 3D Printed Upper-Limb Prostheses for Pediatric Patients. Expert Review of Medical Devices. Submitted February 18, 2018.
I performed about 90% effort in this manuscript. The work was funded with my grants. (Impact Factor: 1.78)

2017

3. Keller J. **J. M. Zuniga**. The Effect of Epoch Length on Time and Frequency Domain Parameters of Electromyographic and Mechanomyographic Signals. Journal of Electromyography and Kinesiology. Submitted Dec. 4, 2017
I performed about 10% effort in this manuscript. The work was funded with my grants. (Impact Factor: 1.51)
4. Dote J, P. Nahuelhual., R. Cubillos, G. Fuentes, and **J. M. Zuniga**. Functionality of the 3D-Printed Hand Prosthesis Cyborg Beast in adolescents with partial hand congenital amputation: a series of cases. Prosthetics and Orthotics International. Submitted Nov. 5, 2017
I performed about 30% effort in this manuscript. The work was funded with my grants. (Impact Factor: 1.185)
5. Huff T., Ludwig P., **Zuniga JM**. The potential for machine learning algorithms to improve and reduce the cost of 3-dimensional printing for surgical planning. Expert Review of Medical Devices. Submitted December 20, 2017.
I performed about 50% effort in this manuscript. The work was funded with my grants. (Impact Factor: 1.78)
6. Ludwig P. Huff T., **Zuniga JM**. The potential role of bioengineering and 3D printing in curing global corneal blindness. Journal of Tissue Engineering. Accepted March 30, 2018.
I performed about 50% effort in this manuscript. The work was funded with my grants. (Impact Factor: 3.34)
7. **Zuniga JM**, Katsavelis D, Peck J, Srivastava R., Pierce J, Young K, Dudley D, Salazar D, and Knarr B. Coactivation Index of Children with Congenital Upper Limb Reduction Deficiencies Before and After using a Wrist-driven 3D Printed Partial Hand Prosthesis. Journal of NeuroEngineering and Rehabilitation. Submitted. December 7, 2017. Working on reviewer's comments
I performed about 90% effort in this manuscript. The work was funded with my grants. (Impact Factor: 3.93)
8. Smith, C., Housh, T., **Zuniga, JM.**, Camic, C., Bergstrom, H., Smith, D., Herda, T., Weir, J., Hill, E., Jenkins, N., Schmidt, R., Johnson, G. (2017). Influences of Interelectrode Distance and Innervation Zone on Electromyographic Signals. International journal of sports medicine, 38 2, 111-117.
I performed about 20% effort in this manuscript. The other co-authors did the rest. The work was funded with Housh, T. grants. (Impact Factor:1.67).
9. Noble EB, Pilarski JM, Vora HK, **Zuniga JM**, Malek MH. Log-Transformed Emg Amplitude-Power Output Relationship: Single-Leg Knee-Extensor Versus Single-Leg Cycle Ergometry. *Journal of strength and conditioning research / National Strength & Conditioning Association*. Apr 15 2017.
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with Malek, H. grants. (Impact Factor:2.065).

10. **Zuniga JM**, Peck J, Srivastava R, Pierce J., Dudley D., Than N., and Stergiou N. Functional Changes through the usage of 3D Printed Transitional Prostheses in Children. *Disability and Rehabilitation: Assistive Technology*. 2017; 8:1-7.
I performed about 90% effort in this manuscript. The work was funded with my grants. (Impact Factor: 1.985)

2016

11. **Zuniga JM**, Peck J, Srivastava R, Katsavelis D, Carson A. An Open Source 3D-Printed Transitional Hand Prosthesis for Children. *JPO: Journal of Prosthetics and Orthotics*. 2016;28(3):103-8. doi: 10.1097/jpo.0000000000000097. PubMed PMID: 00008526-201607000-00004.
I performed about 90% effort in this manuscript. J.P. D.K. R.S. and A.C. did the rest. The work was funded with my grants. (No impact factor available)
12. **Zuniga JM**, Carson AM, Peck JM, Kalina T, Srivastava RM, Peck K. The development of a low-cost three-dimensional printed shoulder, arm, and hand prostheses for children. *Prosthetics and orthotics international*. 2016. Epub 2016/04/28. doi: 10.1177/0309364616640947. PubMed PMID: 27117013
I performed about 90% effort in this manuscript. The co-authors did the rest. The work was funded with my grants. Submission date 9/01/2015. (Impact Factor:1.041)
13. Mikkelsen BM, **Zuniga JM**, Herron WK, Frauso FE, Pulliam AN. The Effect of Cardiorespiratory Fitness on the Assessment of the Physical Working Capacity at the Fatigue Threshold. *International Journal of Research in Exercise Physiology*. 11(2):16-24, 2016.
I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with my grants. (Impact Factor: Not available).
14. Ivy M, **Zuniga JM**, Sikora A, Ino E, Aguero G, Cho E. The Effect of Different Regression-Based Algorithms on Frequency Based EMG Fatigue. *International Journal of Research in Exercise Physiology*. 11(2):25-33, 2016.
I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with my grants. (Impact Factor: Not available).
15. Baniqued A., **Zuniga JM**, Strunc TC., Keenan K., Boken A., Anderson JJ. The Effect of Skinfold on the Assessment of the Mean Power Frequency at the Fatigue Threshold. *International Journal of Exercise Science*. 9(4), 2016.
I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with my grants. (Impact Factor: Not available).
16. Brooks JR, Oketch-Rabah H, Low Dog T, **Zuniga JM**, et al. Safety and performance benefits of arginine supplements for military personnel: a systematic review. *Nutrition reviews*. Nov 2016;74(11):708-721.
I performed about 5% effort in this manuscript. The other co-authors did the rest. The work was funded by an external source. (Impact Factor: 5.5).
17. Smith CM, Housh TJ, Herda TJ, Zuniga JM, Camic CL, Bergstrom HC, et al. Time Course of Changes in Neuromuscular Parameters during Sustained Isometric Muscle Actions. *The Journal of Strength & Conditioning Research*. 9000;Publish Ahead of Print. doi: 10.1519/jsc.0000000000001547. PubMed PMID: 00124278-900000000-96394. 2016.
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with T. Housh. grants. (Impact Factor:2.065).
18. Smith, CM, T.J. Housh, T.J. Herda, **J.M. Zuniga**, E.D. Ryan, C.L. Camic, H.C. Bergstrom, D.B. Smith, J.P. Weir, J.T. Cramer, E.C. Hill, K.C. Cochrane, N.D. Jenkins ND2, R.J. Schmidt, G.O. Johnson . Electromyographic responses from the Vastus Medialis during Isometric Muscle Actions. *International Journal of Sports Medicine*. 37(8):647-52, 2016
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with T.J.H. grants. (Impact Factor:2.065).

2015

19. **Zuniga, J.M.**, D. Katsavelis, J. Peck, J. Stollberg, M. Petrykowski, C. Fernandez, and A. Carson. Cyborg Beast: A Low-Cost 3D-Printed Prosthetic Hand for Children with Upper-Limb Differences. *BMC Research Notes*, 8:10, 2015. **Highly Accessed**.
I performed about 90% effort in this manuscript. D.K., J.P., M.P., C.F. and A.C. did the rest. The work was funded with my grants. (Impact Factor:1.041).
20. Cory M. S., T. J. Housh, T. J. Herda, **J. M. Zuniga**, E. D. Ryan, C. L. Camic, H. C. Bergstrom, D. B. Smith, J. P. Weir, J. T. Cramer, K. C. Cochrane, E. C. Hill, N. D.M. Jenkins, R. J. Schmidt, and G. O. Johnson. Effects of the Innervation Zone on the Time and Frequency Domain Parameters of the Surface Electromyographic Signal. *Journal of Electromyography and Kinesiology*, 5(4):565-70, 2015.
I performed about 20% effort in this manuscript. The other co-authors did the rest. The work was funded with T.J.H (mentor) grants. (Impact Factor: 1.647)
21. Barry M.B., **Zuniga JM**, Brown MM, Garnett WM, Hadden ZV, Nguyen PK, Supplee GA, Svoboda CJ. The Effects of Muscle Cross-sectional Area on the Physical Working Capacity at the Fatigue Threshold. *Journal of Undergraduate Kinesiology Research*. 10(2):20-30, 2015.
I performed about 30% effort in this manuscript. My undergraduate students did the rest. The work was funded with my grants. (No impact factor available).
22. Bergstrom, H.C, T.J. Housh, **J.M. Zuniga**, K.C. Cochrane, J.D. Jenkins, S.L. Buckner, J.A. Goldsmith, R.J. Schmidt, G.O. Johnson, J.T. Cramer. Factors underlying the perception of effort during constant heart rate running above and below the critical heart rate. *Eur J Appl Physiol*. [Epub ahead of print] 2015.
I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with B.H.C grants. (Impact Factor: 2.187)
23. Bergstrom, H.C, T.J. Housh, **J.M. Zuniga**, C. L. Camic, D. A. Traylor, R.J. Schmidt, and G.O. Johnson. Application of the critical heart rate model to treadmill running. *Journal of Strength and Conditioning Research*. 29(8):2237-48, 2015.
I performed about 25% effort in this manuscript. The other co-authors did the rest. The work was funded with B.H.C grants. (Impact Factor:2.075)
24. Blaesser, R.J, L.M. Clous, C.F. Lee, **J.M. Zuniga**, M.H. Malek. Comparing EMG amplitude patterns of responses during dynamic exercise: polynomial versus log-transformed regression. *Scandinavian Journal of Medicine and Science in Sports*. 25(2):159-65, 2015.
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with M.H.M grants. (Impact Factor:2.896).
25. Smith, CM, T.J. Housh, T.J. Herda, **J.M. Zuniga**, E.D. Ryan, C.L. Camic, H.C. Bergstrom, D.B. Smith, J.P. Weir, J.T. Cramer, E.C. Hill, K.C. Cochrane, N.D. Jenkins ND2, R.J. Schmidt, G.O. Johnson . Effects of the Innervation Zone on the Time and Frequency Domain Parameters of the Surface Electromyographic Signal. *Journal of Electromyography and Kinesiology*. 25(4):565-70, 2015
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with T.J.H. grants. (Impact Factor:1.647).

2014

26. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, , H.C. Bergstrom, D. A. Traylor, G.O. Johnson, and R.J. Schmidt. The effect of different exercise protocols and regression-based algorithms on the assessment of the anaerobic threshold. *Journal of Strength and Conditioning Research*, 28(9):2507-12, 2014.
I performed about 90% effort in this manuscript. T.J.H., C.L.C, H.C.B.D.A.T, G.O.J, and R.J.S did the rest. The work was funded with my grants. (Impact Factor:2.075)
27. Bergstrom, H.C, T.J. Housh, **J.M. Zuniga**, C. L. Camic, D. A. Traylor, R.J. R.W. Lewis, Schmidt, and G.O. Johnson. Differences among estimates of critical power and anaerobic work capacity derived from five mathematical model and the 3-min all-out test. *Journal of Strength and Conditioning Research*. 28(3):592-600, 2014.
I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with B.H.C grants. (Impact Factor: 2.075)
28. Bergstrom, H.C, T.J. Housh, **J.M. Zuniga**, E. D. Ryan, C. L. Camic, D. A. Traylor, R.J. Schmidt, and G.O. Johnson. Responses during exhaustive exercise at critical power determined from the 3-min all-out test. *Journal of Sports Sciences*. 31(5):537-45, 2014.

- I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with B.H.C grants. (Impact Factor: 2.246)*
29. Bergstrom, H.C, T.J. Housh, **J.M. Zuniga**, C. L. Camic, D. A. Traylor, R.J. R.W. Lewis, Schmidt, and G.O. Johnson. The Relationships Among Critical Power Determined by a 3-min All-out Test, Respiratory Compensation Point, Gas Exchange Threshold, and Ventilatory Threshold. *Research Quarterly for Exercise and Sport*. 84(2):232-238, 2014.
I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with B.H.C grants. (Impact Factor: 1.566)
30. Bracciano, E.M, **J.M. Zuniga**, A.N. Mita, K.M. King, T.A. Lawson, and K.J. King. The Effects of Precooling on the Assessment of the Physical Working Capacity at the Fatigue Threshold. *Journal of Athletic Medicine*. 2(1):20-28, 2014.
I performed about 40% effort in this manuscript. My undergraduate students did the rest. The work was funded with my grants. (No impact factor available).
31. Kimminau, M.K., **J.M. Zuniga**, Riley C. B., McKenna M.S., McKenzie A.F. Bilateral Differences for the Assessment of Neuromuscular Fatigue. *Journal of Athletic Medicine*. 2(1):45-52, 2014.
I performed about 30% effort in this manuscript. My undergraduate students did the rest. The work was funded with my grants. (No impact factor available).
32. Olusola M. I., Hazamid N.A., Wahab A.K., **Zuniga J.M.** Mechanomyography and muscle function assessment: A review of current state and prospects. *Clinical Biomechanics Journal*. 29(6):691-704, 2014.
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with O.M.I. grants. (Impact Factor:1.97).
33. Olusola M. I., Hazamid N.A., Wahab A.K., **Zuniga J.M.** Mechanomyographic parameter extraction methods: an appraisal for clinical applications. *Sensors (Basel)*. 14(12):22940-70, 2014.
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with O.M.I. grants. (Impact Factor:2.245).
34. Camic, C.L., T.J. Housh, **J.M. Zuniga**, Bergstrom, R.J. Schmidt, and G.O. Johnson. Mechanomyographic and electromyographic responses during fatiguing eccentric muscle actions of the leg extensors. *Journal of applied Biomechanics*. 30(2):255-61, 2014.
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with T.J.H. grants. (Impact Factor:0.984).
35. Camic, C.L., T.J. Housh, **J.M. Zuniga**, D. A. Traylor, H.C. Bergstrom, R.J. Schmidt, and G.O. Johnson. Electromyographic and mechanomyographic responses across repeated maximal isometric and concentric muscle actions of the leg extensors. *Journal of Electromyography and Kinesiology*. I 23(2):342-8, 2014.
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with T.J.H. grants. (Impact Factor:1.647).
36. Camic, C.L., T.J. Housh, **J.M. Zuniga**, D. A. Traylor, H.C. Bergstrom, R.J. Schmidt, and G.O. Johnson. The effects of polyethylene glycosylated creatine supplementation on anaerobic performance measures and body composition. *Journal of Strength and Conditioning Research*. 28(3):825-33, 2014.
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with T.J.H. grants. (Impact Factor:2.075)

2013

37. **Zuniga, J.M**, M. Bubak, B.E. Fisher, D.E. Neighbors, H.S. Osowski, and A.N. Oyen. Electromyographic and gas exchange fatigue thresholds during incremental treadmill running. *Journal of Athletic Medicine*, 1(2): 92-103, 2013.
I performed about 80% effort in this manuscript. My undergraduate students did the rest. The work was funded with my grants. (No impact factor available).
38. **Zuniga, J.M.**, and M. H. Malek. Electromyographic responses of the superficial quadriceps femoris muscles during incremental treadmill running. *Muscle & Nerve*, 48(6):938-44, 2013.
I performed about 60% effort in this manuscript. M.H.M did the rest. The work was funded with my grants. (Impact Factor: 2.283).

39. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, H.C. Bergstrom, D. A. Traylor, G.O. Johnson, and R.J. Schmidt. Neuromuscular and metabolic comparisons between ramp and step incremental cycle ergometer tests. *Muscle & Nerve*, 47(4):555-560, 2013
I performed about 90% effort in this manuscript. T.J.H., C.L.C, H.C.B., D.A.T, G.O.J, and R.J.S did the rest. The work was funded with T.J.H (mentor) grants. (Impact Factor: 2.283)
40. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, , H.C. Bergstrom, D. A. Traylor, G.O. Johnson, and R.J. Schmidt. Metabolic parameters for ramp versus step incremental cycle ergometer tests. *Applied Physiology, nutrition, and Metabolism*, 37(6):1110-1117, 2013
I performed about 90% effort in this manuscript. T.J.H., C.L.C, H.C.B., D.A.T, G.O.J, and R.J.S did the rest. The work was funded with T.J.H (mentor) grants. (Impact Factor: 2.009)
41. Herda, T.J, **J.M. Zuniga**, C. L. Camic, H.C. Bergstrom, D.B. Smith, J.P. Weir, J.T. Cramer, and T.J. Housh. Quantifying the Effects of Electrode Distance from the Innervation Zone on the Electromyographic Amplitude versus Torque Relationships. *Physiological Measurement*. 34(3):315-24, 2013.
I performed about 30% effort in this manuscript. The other co-authors did the rest. The work was funded with T.J.H (mentor) grants. (Impact Factor: 1.808)
42. Bergstrom, H.C, T.J. Housh, **J.M. Zuniga**, D. A. Traylor, R.J. R.W. Lewis, Schmidt, and G.O. Johnson. An examination of neuromuscular and metabolic fatigue thresholds. *Physiological Measurement*. 34(10):1253-67, 2013.
I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with B.H.C grants. (Impact Factor: 1.808)
43. Bergstrom, H.C, T.J. Housh, **J.M. Zuniga**, C. L. Camic, D. A. Traylor, R.J. Schmidt, and G.O. Johnson. Metabolic and neuromuscular responses at critical power from the 3-min all-out test. *Applied Physiology, nutrition, and Metabolism*. 38(1):7-13, 2013.
I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with B.H.C grants. (Impact Factor: 2.009).
44. Traylor, D.A., T.J. Housh, C. L. Camic, **J.M. Zuniga**, H. C. Berstrom, G.O. Johnson, R.J. Schmidt, and R. W. Lewis. The effects of 3 days of concentric on isometric and concentric torque production of the forearm flexors. *Isokinetics and Exercise Science*. 21 (1): 63-68, 2013.
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with T.J.H. grants. (Impact Factor:0.488).

2012

45. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, C.R. Hendrix, Michelle Mielke, G.O. Johnson, Dona J. Housh and R.J. Schmidt. The effects of Creatine Monohydrate Loading on Anaerobic Performance and 1-RM Strength Testing. *Journal of Strength and Conditioning Research*, 26(6):1651-1656, 2012.
I performed about 90% effort in this manuscript. T.J.H., C.L.C, C.R.H., .M.M, G.O.J, and R.J.S did the rest. The work was funded with T.J.H (mentor) grants. (Impact Factor:2.075)
46. Bergstrom, H.C, T.J. Housh, **J.M. Zuniga**, C. L. Camic, D. A. Traylor, R.J. Schmidt, and G.O. Johnson. Estimated times to exhaustion and power outputs at the gas exchange threshold, physical working capacity at the rating of perceived exertion threshold, and respiratory compensation point. *Applied Physiology, nutrition, and Metabolism*. 37:872-879, 2012.
I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with B.H.C grants. (Impact Factor: 2.009).
47. Bergstrom, H.C, T.J. Housh, **J.M. Zuniga**, C. L. Camic, D. A. Traylor, R.W. Lewis, R.J. Schmidt, and G.O. Johnson. Estimates of critical power and anaerobic work capacity from a single, all-out test of less than 3-min. *Sports Medicine & Doping Studies*. 2(2):02-05, 2012.
I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with B.H.C grants. (Impact Factor: 1.45)
48. Bergstrom, H.C, T.J. Housh, **J.M. Zuniga**, C. L. Camic, D. A. Traylor, R.J. Schmidt, and G.O. Johnson. A new single work bout test to estimate critical power and anaerobic work capacity. *Journal of Strength and Conditioning Research*. 26(3):656-63, 2012.
I performed about 15% effort in this manuscript. The other co-authors did the rest. The work was funded with B.H.C grants. (Impact Factor:2.075)

49. Traylor, D.A., T.J. Housh, C. L. Camic, **J.M. Zuniga**, H. C. Berstrom, G.O. Johnson, and R.J. Schmidt. The effects of short-term isokinetic training on isometric and concentric torque of the forearm flexors in females. *Journal of Exercise Physiology online*. 15(1):110-116, 2012.
I performed about 10% effort in this manuscript. The other co-authors did the rest. The work was funded with T.J.H. grants. (Impact Factor:0.355).

2011

50. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, C.R. Hendrix, H.C. Bergstrom, G.O. Johnson, and R.J. Schmidt. The effects of skinfold thicknesses and innervations zone on the mechanomyographic signal during cycle ergometry. *Journal of Electromyography and Kinesiology*, 21(5):789-94, 2011.
51. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, M. Mielke, C.R. Hendrix, G.O. Johnson, D.J. Housh, and R.J. Schmidt. Yearly changes in the anthropometric dimensions of female high school gymnasts. *Journal of Strength and Conditioning Research*, 25(1): 124-128, 2011. (Impact Factor:2.075)
52. **Zuniga, J.M.**, T.J. Housh, M. Mielke, C.R. Hendrix, C.L. Camic, G.O. Johnson, D.J. Housh, and R.J. Schmidt. Gender comparisons of anthropometric characteristics of young sprint swimmers. *Journal of Strength and Conditioning Research*, 25(1): 103-108, 2011. (Impact Factor:2.075)

2010

53. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, C.R. Hendrix, M. Mielke, R.J. Schmidt, and G.O. Johnson. The effects of accelerometer placement on mechanomyographic amplitude and mean power frequency during cycle ergometry. *Journal of Electromyography and Kinesiology*, 20(4):719-725, 2010.
54. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, C.R. Hendrix, R.J. Schmidt, M. Mielke, and G.O. Johnson. A mechanomyographic fatigue threshold test for cycling. *International Journal of Sports Medicine*, 31(9):636-643, 2010.
55. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, C.R. Hendrix, M. Mielke, R.J. Schmidt, and G.O. Johnson. The effects of parallel versus perpendicular electrode orientations on EMG amplitude and mean power frequency from the biceps brachii. *Electromyography and Clinical Neurophysiology*, 50(2):87-96, 2010.
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58. Camic, C.L., C.R. Hendrix, T.J. Housh, **J.M. Zuniga**, M. Mielke, G.O. Johnson, and R.J. Schmidt. The effects of polyethylene glycosylated creatine supplementation on muscular strength and power. *Journal of Strength and Conditioning Research*, 24(12): 3343-3351, 2010. (Impact Factor:2.075)
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61. Camic, C.L., T.J. Housh, **J.M. Zuniga**, C.R. Hendrix, M. Mielke, G.O. Johnson, and R.J. Schmidt. Effects of arginine-based supplements on the physical working capacity at the fatigue threshold. *Journal of Strength and Conditioning Research*, 24(5):1306-1312, 2010. (Impact Factor:2.075)
62. Camic, C.L., T.J. Housh, **J.M. Zuniga**, C.R. Hendrix, M. Mielke, G.O. Johnson, and R.J. Schmidt. The influence of electrode orientation on the electromyographic amplitude and mean power frequency versus isometric torque relationships for the vastus lateralis. *Journal of Exercise Physiology-online*, 13(1):10-20, 2010.

63. Hendrix, C.R., T.J. Housh, C.L. Camic, **J.M. Zuniga**, G.O. Johnson, and R.J. Schmidt. Comparing electromyographic and mechanomyographic frequency-based fatigue thresholds to critical torque during isometric forearm flexion. *Journal of Neuroscience Methods*, 194(1):64-72, 2010.
64. Hendrix, C.R., T.J. Housh, G.O. Johnson, M. Mielke, **J.M. Zuniga**, C.L. Camic, and R.J. Schmidt. The effect of epoch length on electromyographic mean power frequency and amplitude versus time relationships. *Electromyography and Clinical Neurophysiology*, 50(5):219-227, 2010.
65. Hendrix, C.R., T.J. Housh, M. Mielke, **J.M. Zuniga**, C.L. Camic, G.O. Johnson, R.J. Schmidt, and D.J. Housh. Acute effects of a caffeine-containing supplement on bench press and leg extension strength and time to exhaustion during cycle ergometry. *Journal of Strength and Conditioning Research*, 24(3):859-865, 2010. (Impact Factor:2.075)
66. Hendrix, C.R., T.J. Housh, M. Mielke, **J.M. Zuniga**, C.L. Camic, G.O. Johnson, R.J. Schmidt, and D.J. Housh. Acute effects of a caffeine-containing supplement on bench press and leg extension strength and time to exhaustion during cycle ergometry. *Journal of Strength and Conditioning Research*, 24(3):859-865, 2010. (Impact Factor:2.075)
67. Hendrix, C.R., T.J. Housh, **J.M. Zuniga**, C.L. Camic, M. Mielke, G.O. Johnson, R.J. Schmidt, and D.J. Housh. Mechanomyographic frequency-based fatigue threshold test. *Journal of Neuroscience Methods*, 187(1):1-7, 2010.
68. Mielke, M., T.J. Housh, C.R. Hendrix, **J.M. Zuniga**, C.L. Camic, R.J. Schmidt, and G.O. Johnson. A test for determining critical heart rate using the critical power model. *Journal of Strength and Conditioning Research*, 25(2): 504-510, 2010. (Impact Factor:2.075)
69. **Zuniga, J.M.**, K. E. Berg, J. Noble, J. Harder, M.E. Chaffin, V. S. Hanumanthu. Physiological responses to interval training with different intensities and duration of exercise. *Journal of Strength and Conditioning Research*, 25(5):1279-1284, 2010. (Impact Factor: 2.075)

2009

70. **Zuniga, J.M.**, T.J. Housh, C.R. Hendrix, C.L. Camic, M. Mielke, R.J. Schmidt, and G.O. Johnson. The effects of electrode orientation on electromyographic amplitude and mean power frequency during cycle ergometry. *Journal of Neuroscience Methods*, 184 (2):256-62, 2009.
71. **Zuniga, J.M.**, T.J. Housh, M. Mielke, C.L. Camic, C.R. Hendrix, G.O. Johnson, D.J. Housh, and R.J. Schmidt. Validity of Fat-Free Weight Equations for Estimating Mean and Peak Power in High School Wrestlers. *Pediatric Exercise Science*, 21 (1): 100-12, 2009.
72. Camic, C.L., T.J. Housh, M. Mielke, C.R. Hendrix, **J.M. Zuniga**, G.O. Johnson, D.J. Housh, and R.J. Schmidt. Age-related patterns of anthropometric characteristics in young wrestlers. *Medicine and Science in Sport and Exercise*, 41 (5):1014-9, 2009.
73. Hendrix, C.R., T.J. Housh, G.O. Johnson, M. Mielke, C.L. Camic, **J.M. Zuniga**, and R.J. Schmidt. A new EMC frequency-based fatigue threshold test. *Journal of Neuroscience Methods*, 181 (1): 45-51, 2009.
74. Hendrix, C.R., T.J. Housh, G.O. Johnson, M. Mielke, C.L. Camic, **J.M. Zuniga**, and R.J. Schmidt. Comparison of Critical Force to EMG Fatigue Thresholds during Isometric Leg Extension. *Medicine and Science in Sport and Exercise*, 41 (4):956-965, 2009.
75. Hendrix, C.R., T.J. Housh, M. Mielke, **J.M. Zuniga**, C.L. Camic, G.O. Johnson, and R.J. Schmidt. Critical torque, estimated time to exhaustion, and anaerobic work capacity from linear and nonlinear mathematical models. *Medicine and Science in Sport and Exercise*, 41 (12):2185-90, 2009.
76. Mielke, M., T.J. Housh, C.R. Hendrix, C.L. Camic, **J.M. Zuniga**, R.J. Schmidt, and G.O. Johnson. Oxygen Uptake, Heart Rate, and Ratings of Perceived Exertion at the Physical Work Capacity at the Oxygen Consumption Threshold ($PWC\dot{V}O_2$). *Journal of Strength and Conditioning Research*, 23 (4): 1292-9, 2009. (Impact Factor:2.075)

2008

77. Chaffin, M., K. E. Berg, **J.M. Zuniga**, Vidya S. Hanumanthu. Pacing pattern in a 30-minute maximal cycling test. *Journal of Strength and Conditioning Research*, 22(6): 2011-2017, 2008. (Impact Factor:2.075)

ABSTRACTS AT PROFESSIONAL MEETINGS

Abstracts Summary Table

Status	First or Co-author	Total Number	Number of Students Co-authors
Submitted	First: 0; Co: 0	0	0
Presented	First: 19; Co: 29	48	50
Rejected (not listed)	First: 0; Co: 1	0	8
In Preparation	First: 0; Co: 0	0	0
Total	First: 19; Co: 30	49	58

Abstract List

1. Young K, Pierce J, **Zuniga JM**. 3D Prosthesis Effects on Standing Posture in Unilateral Upper Limb Deficient Children. (Human Movement Variability Conference. June 2018. Omaha, NE)
2. Young K, Pierce J, **Zuniga JM**. The Influence of Prosthetic Use on Standing Posture in Adults and Children with Upper Limb Reductions. (University of Nebraska Omaha, Graduate Research. March 2018).
3. Than N, Dudley D, Pierce J, Arce W, Young K, **Zuniga JM**. Refinement of tracking Methodology for Baseball Using Open-Sourced Software. (University of Nebraska Omaha, Graduate Research. Omaha, Nebraska. March 2017).
4. Drew Dudley, Jean Peck, Rakesh Srivastava, James Pierce, Nick Than, Chris Copeland, **Zuniga JM**. Increases in ROM and circumference of the forearm after 6 months of using a 3D printed transitional hand prosthesis (University of Nebraska-Omaha Creative Research Fair. March 2017. Omaha, NE)
5. Drew Dudley, Jean Peck, Rakesh Srivastava, James Pierce, Nick Than, Chris Copeland, **Zuniga JM**. Increases in ROM and circumference of the forearm after 6 months of using a 3D printed transitional hand prosthesis (Human Movement Variability Conference. June 2017. Omaha, NE)
6. Drew Dudley, Jean Peck, James Pierce, David Salazar, Keaton Young, Brian Knarr, **Zuniga JM**. The Effects of an Upper Limb Exoskeleton on Brain Activation of a Stroke Patient. (University of Nebraska-Omaha Creative Research Fair. March 2018. Omaha, NE)
7. **Zuniga JM**, Major MJ, Peck J, Srivastava R, Pierce J., Stergiou N. Technical, Clinical, and Functional Considerations for the Development of 3D Printed Upper-Limb Prostheses for Pediatric Patients. (AAOP Annual Meeting, February 14-17, 2018. New Orleans, Louisiana).
8. **Zuniga JM**, Major MJ, Peck J, Srivastava R, Pierce J., Stergiou N. Technical and Clinical Considerations for the Development of 3D Printed Upper-Limb Prostheses for Pediatric Patients. (AOPA World Congress, September 6-12, 2017. Las Vegas, NV)
9. Drew Dudley, Jean Peck, Rakesh Srivastava, James Pierce, Nick Than, Chris Copeland, **Zuniga JM**. Increases in ROM and circumference of the forearm after 6 months of using a 3D printed transitional hand prosthesis. (American Society of Biomechanics Conference August 2017. Boulder, CO).
10. Pierce, J., Than, N., Dudley, D., & **Zuniga, JM**. "Development of low cost 3D printed transitional prostheses". (2017 Human Movement and Variability Conference, June 1, 2017. Omaha, NE)
11. Pierce, J., Than, N., Dudley, D., & **Zuniga, JM**. "Development of low cost 3D printed transitional prostheses". (American Society of Biomechanics Annual Meeting, August 8-12, 2017. Boulder, CO)
12. Dote J, P. Nahuelhual., R. Cubillos, G. Fuentes, and **Zuniga, JM**. Functionality of the 3D-Printed Hand Prosthesis Cyborg Beast in adolescents with partial hand congenital amputation: a series of cases. (Annual Congress of the International Society of Physical and Rehabilitation Medicine, April 30, 2017. Buenos Aires Argentina).
13. Pierce, J., Than, N., Dudley, D., & **Zuniga, JM**. "Development of low cost 3D printed transitional prostheses". (Annual Biomechanics Symposium, October 13, 2016. Omaha, NE).
14. Maliha, A., Kosanke, E., **JM Zuniga**. "Description and Comparison of Scaling Procedures in Computer Design Programs (Blender and Fusion 360) for 3D Printed Prostheses". (2016 Nebraska Research and Innovation Conference (NRIC):, October 13, 2016. Omaha, NE).

15. **Zuniga, J.M.**, J. Peck, R. Srivastava, and John Stollberg. "Development of low cost 3D printed transitional prostheses". (American Academy of Orthotist & Prosthetist Annual Meeting, March 9-12, 2016. Orlando, FL)
16. **Zuniga, J.M.**, J. Peck, R. Srivastava, and John Stollberg. "Increases in ROM and circumference of the forearm after 6 months of using a 3d printed transitional hand prosthesis". (American Academy of Orthotist & Prosthetist Annual Meeting, March 9-12, 2016. Orlando, FL).
17. **Zuniga, J.M.**, J. Peck, R. Srivastava, and John Stollberg. "Development of low cost 3D printed transitional prostheses". (Association of Children's Prosthetic-Orthotic Clinics Annual Meeting April 13-16, 2016. Broomfield, Colorado)
18. **Zuniga, J.M.**, Peck, J. (May 13, 2015). "Cyborg Beast: A Low-Cost 3D-Printed Prosthetic Hand For Children With Upper-Limb Differences". (Association of Children's Prosthetic-Orthotic Clinics Annual Meeting May 14, 2015. Clearwater Beach, FL)
19. **Zuniga, J.M.**, Katsavelis, D., Petrykowski, M., Carson, A. (January, 2015). "Cyborg Beast: A Low-Cost 3D-Printed Prosthetic Hand for Children with Upper-Limb Differences". (Presented at the 2015 NASA Human Research Program, NASA Johnson Space Center. Huston, TX).
20. **Zuniga, J.M.**, Peck, J, Petrykowski, M. (September, 2014). "Mainstreaming Open Source 3D-Printed Prosthetics for Underserved Populations". (Presented at the Johns Hopkins Hospital, Advance Prosthetic Center, Baltimore MD).
21. **Zuniga, J.M.**, Shull, J. (March, 2014). "eNABLE, a distributed pay it forward network. (Presented at the National Collegiate Inventors and Innovators Alliance (NCIIA) in San Jose, California).
22. **Zuniga, J.M.**, Malek, M. (May, 2013). "Electromyographic Responses of the Superficial Quadriceps Femoris Muscles during Incremental Treadmill Running. (Presented at the Annual American College of Sports Medicine Conference in Indianapolis, Indiana).
23. **Zuniga, J.M.**, C. Harris, T.J. Housh, C.L. Camic, H.C. Bergstrom, Daniel A. Traylor, M. T. Goodman, G.O. Johnson, and R.J. Schmidt. (May, 2012). Neuromuscular parameters for ramp and step incremental cycle ergometer tests. (Presented at the Annual American College of Sports Medicine Conference in San Francisco, California).
24. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, C.R. Hendrix, H.C. Bergstrom, Daniel A. Traylor, G.O. Johnson, and R.J. Schmidt. (June, 2011). A new mechanomyographic amplitude-based fatigue threshold test for cycling. (Presented at the Annual American College of Sports Medicine Conference in Denver, Colorado).
25. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, C.R. Hendrix, H.C. Bergstrom, G.O. Johnson, and R.J. Schmidt. (July, 2010). The relationship between skinfold thicknesses and mechanomyography at different locations on the vastus lateralis during incremental cycle ergometry. (Presented at the National Strength and Conditioning Association Annual Conference in Orlando, Florida).
26. **Zuniga, J.M.**, T.J. Housh, C.L. Camic, C.R. Hendrix, G.O. Johnson, and R.J. Schmidt. (June, 2010). A comparison of fatigue thresholds derived from the amplitude and frequency domains of the electromyographic signal. (Presented at the Annual American College of Sports Medicine Conference in Baltimore, Maryland).
27. **Zuniga, J.M.**, C.R. Hendrix, C.L. Camic, M. Mielke, G.O. Johnson, R.J. Schmidt, and T.J. Housh. (October, 2009). The effects of micronized creatine supplementation on mean and peak power from the Wingate test. (Presented at the Annual Southwest American College of Sports Medicine Conference in San Diego, California).
28. **Zuniga, J.M.**, T. J. Housh, FNSCA, C.L. Camic, M. Mielke, C.R. Hendrix, G.O. Johnson, R.J. Schmidt, and D. J. Housh. (July, 2009). Gender comparisons of anthropometric characteristics of young sprint swimmers. (Presented at the National Strength and Conditioning Association Annual Conference in Las Vegas, Nevada).
29. **Zuniga, J.M.**, C.L. Camic, M. Mielke, C.R. Hendrix, T.J. Housh, G.O. Johnson, R.J. Schmidt. (May, 2009). The effects of parallel versus perpendicular electrode orientations on EMG amplitude and mean power frequency from the biceps brachii. (Presented at the Annual American College of Sports Medicine Conference in Seattle, Washington).
30. **Zuniga, J. M.**, T.J. Housh, C.L. Camic, M. Mielke, C.R. Hendrix, G.O. Johnson, R.J. Schmidt, D.J. Housh. (July, 2008). Validity of fat-free weight equations for estimating mean and peak power in high school wrestlers. (Presented at the National Strength and Conditioning Association Annual Conference in Las Vegas, Nevada).

31. **Zuniga, J. M.**, K. E. Berg, FACSM, J. Noble, J. Harder, M. Chaffin, Vidya S. Hanumanthu (May, 2008). Physiological responses and role of $\dot{V}O_2$ slow component to interval training with different intensities and durations of work. (Presented at the Annual American College of Sports Medicine Conference in Indianapolis, Indiana).
32. Goodman M. T., **Zuniga J.M.**, and C. Harris. (May, 2012). Gas Exchange Fatigue Thresholds From Ramp Versus Step Incremental Cycle Ergometer Tests (Presented at the Annual American College of Sports Medicine Conference in San Francisco, California).
33. Camic, C.L., T.J. Housh, **J.M. Zuniga**, C.R. Hendrix, H. C. Bergstrom, G.O. Johnson, R.J. Schmidt, and D.J. Housh. (July, 2010). The influence of electrode placement on the physical working capacity at the fatigue threshold. (Presented at the National Strength and Conditioning Association Annual Conference in Orlando, Florida).
34. Bergstrom, H.C., **J.M. Zuniga**, T.J. Housh, C.L. Camic, C.R. Hendrix, G.O. Johnson, and R.J. Schmidt. (July, 2010). The relationship between skinfold thickness and the time and frequency domains of the surface electromyographic signal during cycle ergometry. (Presented at the National Strength and Conditioning Association Annual Conference in Orlando, Florida).
35. Camic, C.L., T.J. Housh, C.R. Hendrix, **J.M. Zuniga**, G.O. Johnson, D.J. Housh, and R.J. Schmidt. (June, 2010). A comparison of fatigue thresholds derived from the frequency domain of the electromyographic signal and gas exchange parameters. (Presented at the Annual American College of Sports Medicine Conference in Baltimore, Maryland).
36. Hendrix, C.R., T.J. Housh, **J.M. Zuniga**, M. Mielke, C.L. Camic, G.O. Johnson, and R.J. Schmidt. (June, 2010). Comparison of a new mechanomyographic frequency-based fatigue threshold test and critical torque. (Presented at the Annual American College of Sports Medicine Conference in Baltimore, Maryland).
37. Camic, C.L., T.J. Housh, **J.M. Zuniga**, M. Mielke, C.R. Hendrix, G.O. Johnson, R.J. Schmidt, and D.J. Housh. (October, 2009). Effects of four weeks of an arginine-based supplement on the ventilatory threshold and peak oxygen uptake. (Presented at the Annual Southwest American College of Sports Medicine Conference in San Diego, California).
38. Hendrix, C.R., T.J. Housh, **J.M. Zuniga**, M. Mielke, C.L. Camic, G.O. Johnson, D.J. Housh, and R.J. Schmidt. (October, 2009). Effects of polyethylene glycosylated creatine supplementation on muscular strength. (Presented at the Annual Southwest American College of Sports Medicine Conference in San Diego, California).
39. Camic, C.L., T.J. Housh, **J.M. Zuniga**, C.R. Hendrix, M. Mielke, G.O. Johnson, R.J. Schmidt, and D.J. Housh. (July, 2009). Effects of four weeks of arginine supplementation on the physical working capacity at the fatigue threshold. (Presented at the National Strength and Conditioning Association Annual Conference in Las Vegas, Nevada).
40. Hendrix, C.R., T.J. Housh, M. Mielke, C.L. Camic, **J.M. Zuniga**, G.O. Johnson, and R.J. Schmidt. (July, 2009). A comparison of critical torque and electromyographic mean power frequency fatigue threshold during isometric leg extension. (Presented at the National Strength and Conditioning Association Annual Conference in Las Vegas, Nevada).
41. Camic, C.L., M. Mielke, C.R. Hendrix, **J.M. Zuniga**, T.J. Housh, G.O. Johnson, R.J. Schmidt. (May, 2009). The effect of electrode orientation on electromyographic amplitude and mean power frequency versus isometric torque relationships. (Presented at the Annual American College of Sports Medicine Conference in Seattle, Washington).
42. Hendrix, C.R., T.J. Housh, G.O. Johnson, M. Mielke, C.L. Camic, **J.M. Zuniga**, and R.J. Schmidt. (May, 2009). Anaerobic work capacity from linear and nonlinear mathematical models. (Presented at the Annual American College of Sports Medicine Conference in Seattle, Washington).
43. Camic, C.L., T.J. Housh, M. Mielke, C.R. Hendrix, **J.M. Zuniga**, G.O. Johnson, D.J. Housh, and R.J. Schmidt. (July, 2008). Anthropometric growth patterns of young wrestlers. (Presented at the National Strength and Conditioning Association Annual Conference in Las Vegas, Nevada).
44. Hendrix, C.R., T.J. Housh, M. Mielke, C.L. Camic, **J.M. Zuniga**, G.O. Johnson, and R.J. Schmidt. (July, 2008). A Comparison of critical force and electromyographic fatigue during isometric muscle actions of the leg extensors. (Presented at the National Strength and Conditioning Association Annual Conference in Las Vegas, Nevada).
45. Mielke, M., T.J. Housh, M.H. Malek, T.W. Beck, C.R. Hendrix, **J.M. Zuniga**, C.L. Camic, R.J. Schmidt, G.O. Johnson, and D.J. Housh. (July, 2008). The effects of a calorie dense high protein supplement on

- exercise performance and body composition during resistance training. (Presented at the National Strength and Conditioning Association Annual Conference in Las Vegas, Nevada).
46. Schmidt, R.J., M. Mielke, M.H. Malek, T.J. Housh, C.L. Camic, **J.M. Zuniga**, C.R. Hendrix, and G.O. Johnson. (July, 2008). Comparison of army, navy, and marine corps ROTC physical fitness test scores and evaluation of Special Forces Assessment and Selection Success. (Presented at the National Strength and Conditioning Association Annual Conference in Las Vegas, Nevada).
 47. Mielke, M., T.J. Housh, C. R. Hendrix, C.L. Camic, **J.M. Zuniga**, R.J. Schmidt, and G.O. Johnson. (May, 2008). Oxygen uptake, heart rate, and ratings of perceived exertion at the PWC $\dot{V}O_2$. (Presented at the Annual American College of Sports Medicine Conference in Indianapolis, Indiana).
 48. Camic, C.L., M. Mielke, C. R. Hendrix, **J. Zuniga**, G.O. Johnson, and T.J. Housh. (May, 2008). Cross-cultural validation of isokinetic peak torque prediction equations on young American wrestlers. (Presented at the Annual American College of Sports Medicine Conference in Indianapolis, Indiana).

PAPER REVIEWS

- Article reviewed on July 19, 2017 for Transactions on Mechatronics
- Article reviewed on January 31, 2017 for Prosthetics & Orthotics International
- Article reviewed on September 2nd, 2015 for PLOS ONE.
- Article reviewed on September 2nd, 2015 for American Academy of Orthotist & Prosthetist.
- Article reviewed on September 2nd, 2013 for Medical & Biological Engineering & Computing.
- Article reviewed on July 24th, 2013 for the Journal of Athletic Medicine.
- Article reviewed on June 17th, 2013 for the Journal of Athletic Medicine.
- Article reviewed on April 24th, 2013 for the Journal of Athletic Medicine.
- Article reviewed on February 1st, 2013 for the Journal of Strength and Conditioning Research.
- Article reviewed on November 28th, 2011 for The Chinese Journal of Physiology.
- Article review on March 4th, 2011 for the Journal Sensors.
- Article reviewed on December 30th, 2011 for Muscle & Nerve.

BOOK CHAPTERS

- Eckerson, J.M. and **Zuniga, J.M.**, Searching the Scientific Literature. In: *ACSM Research Methods (1st Ed.)*. Lawrence E. Armstrong and William J. Kraemer, Eds. Human Kinetics (In Progress).

PUBLIC ORAL PRESENTATIONS

Public Oral Presentations Summary Table

Status	International	National	Local
Presented	20	10	27
Total	57		

International Presentations (20 presentations)

- 1) Research in Biomechanics and 3D printed prosthetics. Sunshine Rehabilitation Hospital, First Rehabilitation Hospital, and University of Tongji Shanghai, China. (May 8-12, 2017). Three presentations about research in biomechanics and 3D printed prosthetics.
- 2) Tour EDUTIC Chile (July 1-August 11, 2016). Several presentations about the use of 3D printing as a tool Social Innovation. Two presentations in the Universidad San Sebastian, Santiago Chile, one presentation in Universidad de Vina del Mar, Vina del mar Chile, 3 presentations at the Universidad Austral "Congreso Nacional de Kinesiologia" and PAR EXPLORA de CONICYT Los Ríos, Valdivia Chile, 3 presentations at the Universidad Santo Tomas, Antofagasta Chile, and one presentation at the Universidad Autonoma of Chile. https://issuu.com/uautonomadechile/docs/autonoma_al_dia_numero_45 and <http://www.congresodelfuturo.cl/impresion-3d-nueva-oportunidad-de-vivir/congresodelfuturo/2016-06-22/152231.html>

- 3) Impacto social de las nuevas tecnologías. Congreso Del Futuro, Santiago Chile, January 2016. Presenter: Dr. Zuniga. <http://www.congresodelfuturo.cl/jorge-zuniga/congresodelfuturo/2015-11-09/181252.html>.
- 4) Impacto social de las nuevas tecnologías. Congreso Del Futuro, Valparaiso Chile, January 2016. Presenter: Dr. Zuniga.
- 5) Impacto social de las nuevas tecnologías. Congreso Del Futuro, La Serena Chile, January 2016. Presenter: Dr. Zuniga.
- 6) The 3D-Printed Prosthetic Revolution. Hewlett-Packard Innovation Day, Santiago Chile, November 23, 2015. Presenter Dr. Zuniga
- 7) A 3D-Printed Prosthetic Hand for Children. Manuel Barros Borgono High school, Santiago, Chile, October 20, 2015. Presenter: Dr. Zuniga.
- 8) A 3D-Printed Prosthetic Hand for Children. Department of Electrical Engineering, Biomedical Engineering major, Concepcion, Chile, October 16, 2015. University of Concepcion. Presenter: Dr. Zuniga.
- 9) A 3D-Printed Prosthetic Hand for Children. Centro de Desarrollo de Tecnologías de Inclusión de la Universidad Católica (CEDETI) located Santiago, Chile, December 3, 2014. Catholic University of Chile. Presenter: Dr. Zuniga.
- 10) A 3D-Printed Prosthetic Hand for Children. Instituto Teleton and Rehabilitation Center located Santiago, Chile, December 4, 2014. Presenter: Dr. Zuniga.
- 11) A 3D-Printed Prosthetic Hand for Children. Hospital del Trabajador located Santiago, Chile, December 4, 2014. Presenter: Dr. Zuniga.

National (10 presentations)

- 1) Zuniga JM, Major MJ, Peck J, Srivastava R, Pierce J., Stergiou N. Technical and Clinical Considerations for the Development of 3D Printed Upper-Limb Prostheses for Pediatric Patients. (AOPA World Congress, September 6-12, 2017. Las Vegas, NV)
- 2) Development of 3D printed prostheses for children and clinical findings. Grand rounds University of Kansas Medical Center (May 18, 2017). https://www.youtube.com/watch?v=fMDyitlg5_s&feature=youtu.be
- 3) 3D printed prostheses for pediatrics. Falmouth, Maine (April 16 to 29, 2017). <http://brunosnotes.blogspot.com/>
- 4) 3-D Printing and the Future of O&P. **American Academy of Orthotist & Prosthetist Annual Meeting**, March 9-12, 2016. Orlando, FL. Dr. Zuniga. http://www.academyannualmeeting.org/2016/education/organized_sessions/
- 5) Anthropometric, Range of Motion and Strength Changes After 6 Months of Using the Cyborg Beast, an Open Source Wrist Driven 3D-Printed Prosthetic Hand for Children. Midwest Chapter **American Academy of Orthotists & Prosthetists**, 2015 Annual Meeting and Scientific Session, Wednesday, May 27, 2015 - Friday, May 29, 2015. Hyatt Rosemont. Presenter: Dr. Zuniga.
- 6) 3D Printed Prostheses for Children. Make/Happen. September, 2015. <http://strictlybusinessomaha.com/news/non-profit/greater-omaha-chamber-announces-dynamic-speaker-lineup-for-inaugural-makehappen/>
- 7) Cyborg Beast: An Open Source Low-Cost 3D-Printed Prosthetic Hand For Children With Upper-Limb Differences. **Association of Children's Prosthetic-Orthotic Clinics** Annual Meeting May 16, 2015. Hilton Clearwater Beach Resort, Clearwater Beach, Florida. Presenter: Dr. Zuniga.
- 8) Development of low-cost 3D printed prosthetic devices. **2015 Innovation Kansas Summit**, Friday May 1st, ICC West, 2615 W. Main, Independence, Kansas. Presenter: Dr. Zuniga.
- 9) Mainstreaming Open Source 3D-Printed Prosthetics for Underserved Populations Sunday Sept 28, 2014, **Johns Hopkins Hospital**, Advance Prosthetic Center, Baltimore MD. Presenters: Dr. Zuniga (EXS Faculty), Jean peck (OT from Creighton Medical Center), and Marc Petrykowski (EXS major) presented preliminary data and future research directions in low-cost prosthetics.
- 10) Low-Cost 3D Printed Assistive Devices: A technological innovation that has an impact on the NASA strategic goals. Friday January 16th. **NASA Johnson Space Center**, B261, SK3 Houston, TX 77058. Presenters: Dr. Zuniga (EXS Faculty), Adam Carson (EXS major), and Marc Petrykowski (EXS major). Sponsor: NASA Nebraska EPSCor

- 11) Nutritional supplementation to decrease muscle breakdown. **National Strength and Condition Association**. 37th National conference. July 10th, 2014. Las Vegas, NV 89109.

Local (27 presentations)

- 1) Presentation to University of Nebraska Board of Regents. 3D printing in Nebraska: Clinical Applications. University of Nebraska Board of Regents. September 21, 2017.
- 2) Keynote Speaker. Innovation: A 3D-printed hand named the cyborg beast. OLC collaborate Nebraska 2017, UNMC, Omaha, Nebraska. <https://onlinelearningconsortium.org/attend-2017/collaborate-nebraska/>
- 3) Medical 3D Printing Seminar sponsored by UNMC Student Senate, University of Nebraska Medical Center March 14, 2017.
- 4) 3D Printed Prostheses for Children. College of Allied Health Professions Research Seminar Series. University of Nebraska Medical Center. December 1, 2016.
- 5) 3D Printing in Healthcare Expert Panel: October 4, 2016. University of Nebraska Medical Center Innovation Week.
- 6) Demo Day “3D Printing Prosthetic Innovations”: October 5, 2016. University of Nebraska Medical Center Innovation Week.
- 7) Low-Cost 3D Prosthetics Hand for Children. November 12nd, 2015. Presenters: Dr. Zuniga (EXS Faculty), Adam Carson (EXS Major), and Elizabeth Kosanke (EXS Major) and Joseph Bowens (Med School) perform a workshop on 3D printing. Millard North Middle School, Omaha, NE.
- 8) “AIM Infotec 2016” April 21, 2015. Adam Carson, Marc Petrykowski, Nicholas Than, Christopher Wong, Maggie Fleita, Maggie Griffin (EXS Majors). Cyborg beast: an open source low-cost 3d-printed prosthetic line for children with upper-limb differences.
- 9) “Nebraska Academy of Sciences” NASA Nebraska EPSCoR. April 17, 2015. Adam Carson (EXS Major), Alexandra Maliha (Environmental Science Major), and Dr. Zuniga (EXS Faculty). Cyborg beast: an open source low-cost 3d-printed prosthetic line for children with upper-limb differences.
- 10) “Nebraska Academy of Sciences” NASA Nebraska EPSCoR. April 17, 2015. Mark Petrykowski (EXS Major), Maggie Fleita (Exercise Science Major), and Dr. Zuniga (EXS Faculty). Low-Cost 3D-Printed Prosthetic Devices for Children.
- 11) “Nebraska Academy of Sciences” NASA Nebraska EPSCoR. April 17, 2015. Joseph Lesnak (Exercise Science Major) and Dr. Zuniga (EXS Faculty). Gender Differences for the Assessment of Neuromuscular Fatigue.
- 12) “St. Albert’s/Research Day” Creighton University. April 14, 2015. Adam Carson (EXS Major), Alexandra Maliha (Environmental Science Major), and Dr. Zuniga (EXS Faculty). Cyborg beast: an open source low-cost 3d-printed prosthetic line for children with upper-limb differences.
- 13) “St. Albert’s/Research Day” Creighton University. April 14, 2015. Mark Petrykowski (EXS Major), Maggie Fleita (Exercise Science Major), and Dr. Zuniga (EXS Faculty). Low-Cost 3D-Printed Prosthetic Devices for Children.
- 14) “St. Albert’s/Research Day” Creighton University. April 14, 2015. Joseph Lesnak (Exercise Science Major), and Dr. Zuniga (EXS Faculty). Gender Differences for the Assessment of Neuromuscular Fatigue.
- 15) “St. Albert’s/Research Day” Creighton University. April 14, 2015. Joseph Lesnak (Exercise Science Major), and Dr. Zuniga (EXS Faculty). Gender Differences for the Assessment of Neuromuscular Fatigue.
- 16) “St. Albert’s/Research Day” Creighton University. April 14, 2015. Christian Andreen, Andrew Jochum (Exercise Science Major), and Dr. Zuniga (EXS Faculty). Gender Differences for the Assessment of Neuromuscular Fatigue.
- 17) “St. Albert’s/Research Day” Creighton University. April 14, 2015. Morgan Busboom (Exercise Science Major), Marc Petrykowski (Exercise Science Major), Benjamin Kohler (Exercise Science Major), Gwendolyn Devonshire (Exercise Science Major), Nicholas Hiraoka (Exercise Science Major), Cortney Kelley (Exercise Science Major), Anne Sullivan (Exercise Science Major), and Dr. Zuniga (EXS Faculty). The effect of body mass index on the assessment of the physical working capacity at the fatigue threshold.

- 18) “St. Albert’s/Research Day” Creighton University. April 14, 2015. Mariah Sommer (Exercise Science Major), Olivia Chambers (Exercise Science Major), Courtney Coslor (Exercise Science Major), Emily Esch (Exercise Science Major), Larissa Hamada (Exercise Science Major), Alexander Heimes (Exercise Science Major), Julia Hummel (Exercise Science Major), and Dr. Zuniga (EXS Faculty). The effects of cardiorespiratory fitness on the assessment of the physical working capacity at the fatigue threshold.
- 19) “St. Albert’s/Research Day” Creighton University. April 14, 2015. Meghan Barry (Exercise Science Major), Makenna Brown (Exercise Science Major), William Garnett (Exercise Science Major), Zachary Hadden (Exercise Science Major), Paul Nguyen (Exercise Science Major), Geoffrey Supplee (Exercise Science Major), and Dr. Zuniga (EXS Faculty). The effects of muscle cross-sectional area on the physical working capacity at the fatigue threshold.
- 20) “Nebraska Robotic Expo” February 21, 2015. Dr. Zuniga (EXS Faculty), Adam Carson (EXS Major), Marc Petrykowski (EXS Major), Christian Andreen (EXS Major), Zoe Reed (EXS Major), Nick Than, Christopher Wong, Maggie Fleita, Maggie Griffin perform 3d printing workshop for children interested in science and biomedical engendering. Strategic Air and Space Museum in Ashland, Nebraska.
- 21) “Celebration of Mind-Nebraska” is a community collaboration to celebrate STEM. Saturday October 18th, 2014. Dr. Zuniga (EXS Faculty), Adam Carson (EXS Major), Marc Petrykowski (EXS Major), Christian Andreen (EXS Major), and Zoe Reed (EXS Major) perform 3d printing workshop for children interested in science and biomedical engendering. KANEKO, 1111 Jones St, Omaha, Nebraska.
- 22) Development of Low-Cost 3D Prosthetics Hand for Children. September 26th, 2014.
Presenters: Dr. Zuniga (EXS Faculty), presented preliminary data and future research directions in low-cost prosthetics. **Exercise Science Departmental Seminar, School of HPER, UNO, NE, 68182.**
- 23) Development of Low-Cost 3D Prosthetics Hand for Children. October 7th, 2014.
Presenters: Dr. Zuniga (EXS Faculty), presented preliminary data and future research directions in low-cost prosthetics. **Exercise for Special Populations, School of HPER, UNO, NE, 68182.**
- 24) Development of Low-Cost 3D Prosthetics Hand for Children. Friday July 9th, 2014.
Presenters: Dr. Zuniga (EXS Faculty), presented preliminary data and future research directions in low-cost prosthetics. **Gaining STEAM Event, Boys & Girls Clubs of the Midlands’ STEM Summer & School Break Academy, Omaha, NE.**
- 25) Development of Low-Cost 3D Prosthetics Hand for Children. August 2nd, 2014.
Presenters: Dr. Zuniga (EXS Faculty) and Marc Petrykowski (EXS major) presented preliminary data and future research directions in low-cost prosthetics. **The MakerTech group workshop, Boys & Girls Clubs of the Midlands’ STEM Summer & School Break Academy, Omaha, NE.**
- 26) Development of Low-Cost 3D Prosthetics Hand for Children. April 29nd, 2014.
Presenters: Dr. Zuniga (EXS Faculty), Adam Carson (EXS Major), and Marc Petrykowski (EXS Major) presented preliminary data and future research directions in low-cost prosthetics. **Millard North Middle School: STEM, Omaha, NE.**
- 27) The Truth about Sports Nutrition. Dr. Zuniga (EXS Faculty) presented a sports nutrition seminar. Artist Lecture Series Student Symposium at **Hastings College**, in Hastings NE, 68901

Others

- “Development of Low-Cost 3D Prosthetics” Channel 7 KETV. Interview.
- “Low-Cost 3D Prosthetics for Kids” Newspaper, Omaha World Herald. Interview.
- “Muscle Fiber Typing in Endurance Athletes” Competitive Magazine press question. Expert advice via phone.
- “Nutrition and Exercise for the mom and child” Liberty Elementary School, Completely KIDS Program, Omaha NE. (2012-2013)
- “Nutritional considerations before, during, and after a triathlon event” University of Nebraska at Omaha, Omaha NE. (2010)

- “Pacing strategies during different triathlons distances” University of Nebraska at Omaha, Omaha NE. (2009)
- “Exercise and Nutrition”, Chicano Awareness Center, Omaha, NE. (2006)
- “Fitness Testing and Weight Loss”, Interfaith Health Service, Omaha, NE (2006)

PATENTS

Patents Pending (7 patent application)

- Hybrid-Drive Upper-Limb Prosthesis. New Invention Notification filed on December 22, 2017. Primary contact: Jorge M. Zuniga
- Upper Limb 3D Scanning System. New Invention Notification filed on November 10, 2017. Primary contact: Jorge M. Zuniga
- Footwear with interchangeable outsoles for optimizing different biomechanical parameters using online optimization. New Invention Notification filed on October 26, 2017. Primary contact: Philippe Malcolm
- Hydraulic Assembly for a Prosthetic Device. New Invention Notification filed on October 14, 2017. Primary contact: Jorge M. Zuniga
- 3D printed rotation mechanisms for prostheses: Application number: 62/28,6475. Application filed January 25, 2016. Primary contact: Jorge M. Zuniga
- 3D Printed Swimming Hand. Application number: 61/95,4020. March 17, 2014. Primary contact: Jorge M. Zuniga
- 3D Printed Weight Lifting Hand. Application number: 61/952,994. March 14, 2014. Primary contact: Jorge M. Zuniga

DISSERTATIONS AND THESES COMMITTEES

1. Master Thesis (M.S. in Biomechanics): James Pierce. Biomechanics Department. University of Nebraska Omaha, USA. Title: TBA.
2. Doctoral Dissertation (Ph.D. in Exercise Physiology & Nutrition): Haley Bergstrom, Exercise Physiology and Nutrition at the University of Nebraska Lincoln, USA. Title: Physiological Responses at the Critical Heart Rate during Treadmill Running, defended May, 9, 2013.
3. Master Thesis (M.S. in Biomedical Engineering): Enrique Ignacio Germany Morrison, Department of Biomedical Engineering, Universidad de Concepcion, Concepcion, Chile. Title: Tactile Feedback Control of Myoelectric Hand prosthesis, defended July 17, 2015.

GRANTS /FUNDING (TOTAL AWARDED = \$1,033,999; AWARDED AS PI: \$648,998.8)**Faculty Grants Summary Table**

Status	PI or Co-PI	Number (#)	Amount (\$)
Pending Grants	PI=3; Co-PI=1	4	949,278
Ongoing Grants	PI=6; Co-PI=0	6	271,707.81
Completed	PI=10; Co-PI=6	16	1,033,999
Not Funded	PI=9; Co-PI=0	9	5,930,901
In Preparation	PI=1; Co-PI=0	1	2,500,000
Total	PI=29; Co-PI=7	36	10,685,886

Faculty Grants List

2018 (Spring)	PI. \$2,500,000. The influence of 3D printed prostheses on neural activation patterns of the primary motor cortex in children with unilateral congenital upper-limb reductions. NIH R01. National Institute of Health. In preparation.
2018 (Spring)	Co-PI. \$150,000. Assessment of Virtual Reality and Exoskeleton Rehabilitation Post-Stroke. Nebraska Research Institute (NRI) Collaboration Initiative. Pending.
2018 (Spring)	PI. \$223,477. Development of Low Cost Medical Grade 3D-Printed Transitional Prostheses. NIH STTR. Pending.
2018 (Spring)	PI. \$425,801. The influence of using a 3D printed partial hand prosthesis in neuromuscular coordination of children with unilateral congenital upper limb reductions. NIH R15. Pending.
2018 (Spring)	PI. \$150,000. A Low-cost Methodology for the Development of 3D Printed Anatomical Models for Pre-Surgical Planning. Nebraska Research Institute (NRI) Collaboration Initiative. Pending.
2018 (Spring)	PI. \$5,500. Innovative Student Fellowship Award. Innovative Prosthetics & Orthotics. Ongoing.
2018 (Spring)	PI. \$5,500. Innovative Student Fellowship Award. Innovative Prosthetics & Orthotics. Ongoing.
2018 (Spring)	PI. \$750,000. Development of 3D Printed Upper-Limb Transitional Prostheses for Veterans and Military Personnel. CDMRP OR170058. Not funded.
2018 (Spring)	PI. \$2,182,529. The influence of 3D printed prostheses on neural activation patterns of the primary motor cortex in children with unilateral congenital upper-limb reductions. NIH R01. National Institute of Health. Not funded.
2018 (Spring)	PI. \$8,000. The Influence of Upper-limb Prostheses in Brain Activity of Children. Teacher-Researcher Partnership Program. Ongoing.
2017 (Fall)	PI. \$12,207.81. 3D Printed Prostheses for Children. National Institute of Health (NIH), Loan Repayment Program. Ongoing.
2017 (Fall)	PI. \$25,000. Improvements of an Electronically-Powered 3D Printed Arm Prosthesis. NASA Nebraska Office Mini-Grant. Completed.

- 2017 (Fall) PI. \$150,000. Developing and Testing of Low-cost 3D Printed Prostheses to Restore and Improve Function of Children with Congenital or Traumatic Below Elbow Amputations. System Science Collaboration Initiative. **Ongoing.**
- 2017 (Fall) PI. \$96,000. An Analysis of Localized Muscle Fatigue, I-Beam Surface Coating, and Harness and Tool Belt on Gait Stability for Steel Erection. System Science Collaboration Initiative. **Ongoing.**
- 2017 (Spring) PI. \$5,000. Low-Cost, Open-Source Methodology to 3D Print Anatomical Models for Pre-Surgery Planning. University Committee on Research and Creative Activity (UCRCA). **Completed.**
- 2017 (Spring) PI. \$8,000. Development and Testing of 3D Printed Prostheses, Orthoses, and Assistive Devices for Children and Adults. Teacher-Researcher Partnership Program. **Completed.**
- 2016 (Fall) PI. \$7,500. Low-cost Tracking Methodology for Baseball Using Open-Sourced Software. The Ridge House Group, LLC (College Splits). **Completed**
- 2016 (Fall) PI. -\$190,095. Acquisition of a professional grade 3D printer “OBJET260 Connex3” for Research, Training and Outreach Activities. Nebraska EPSCoR, National Science Foundation. **Completed.**
- 2016 (Spring-Summer) PI. -\$15,000.00. *3D Printed Prostheses for Children. A tool to monitor Human Movement.* Autodesk Foundation. **Completed.**
- 2015 (Fall) PI - \$15,000. *Development of Low Cost Mechanical Devices for Children with Upper Limb Differences.* The Dr. George F. Haddix President’s Faculty Research Fund. **Completed.**
- 2015 (Summer) PI - \$50,000.00. Development of *Low-Cost 3D-Printed Prosthetic and Assistive Devices.* Nebraska Department of Economic Development. **Completed.**
- 2015 (Summer) PI - \$5,000.00. *Development of Open sourced 3D-Printed Modular Hand Prostheses.* E-enable the Future Foundation. **Completed.**
- 2014 (Fall) PI - \$400,000.00. *Low-Cost 3D-Printed Prosthetic Hand for Children with Upper-Limb Differences: An Educational Outreach.* Faculty Early Career Development (CAREER) Program. **Not funded.**
- 2014 (Fall) PI - \$2,500,000.00. *Low-Cost 3D Printed Prosthetics and Orthotics Devices for Children: An Open Source Project.* National Institutes of Health (NIH) Pioneer Award Program, DP1. **Not funded.**
- 2014 (Fall) PI - \$20,000. *Low-Cost 3D-Printed Prosthetic Hand and Fitting Methodology for Children with Upper-Limb Differences.* Nebraska EPSCoR FIRST AWARD. **Not funded.**
- 2014 (Fall) PI - \$19,896. *Low-Cost 3D Printed Prosthetic Devices for Children and Adults with Upper Limb Differences.* NASA Nebraska EPSCoR Research Mini-Grant. **Completed.**

- 2013 (Fall) PI - \$15,000. *Development of Low Cost Mechanical Devices for Children with Upper Limb Differences*. The Dr. George F. Haddix President's Faculty Research Fund. **Not funded.**
- 2013 (Fall) PI - \$4,300. *A Low Cost mechanical Hand for Children with Upper-Limb Differences*". Faculty research fellowship program summer of 2014. **Completed.**
- 2012 (Fall) PI - \$10,000. *Assessment of neuromuscular fatigue and muscular function using electromyography and mechanomyography*. Christopher Columbus Foundation-U.S. Chamber of Commerce Life Sciences Awards **Not funded.**
- 2012 (Fall) PI - \$15,000. *Differences in Neuromuscular Fatigue, Strength, and Muscle Morphology of the Quadriceps between Individuals with and without a History of Arthroscopic Partial Meniscectomy*. The Dr. George F. Haddix President's Faculty Research Fund **Not funded.**
- 2012 (Fall) PI - \$38,372. *Neuromuscular and Metabolic Responses to Interval Training with Different Durations of Exercise*. Nebraska EPSCoR First Award. **Not funded.**
- 2012 (Fall) PI - \$4,300. *Neuromuscular and Metabolic Responses to Interval Training with Different Durations of Exercise*. Faculty research fellowship program summer of 2013 (not funded). **Completed.**
- 2010 (Fall) Co-Investigator and Study Coordinator (effort 20%) - \$100,000, *The effects creatine supplementation on exercise performance and lean body mass*. General Nutrition Company (GNC), Pittsburgh, Pennsylvania, (awarded, GNC-2010-002; P.I.: Terry J. Housh, PhD). **Completed.**
- 2009 (Summer) Co-Investigator and Study Coordinator (effort 20%) - \$60,000, *The effects of 28 days of creatine supplementation on anaerobic capabilities and muscle strength*. General Nutrition Company (GNC), Pittsburgh, Pennsylvania, (awarded, GNC-2009-001B; P.I.: Terry J. Housh, PhD). **Completed.**
- 2009 (Summer) Co-Investigator - \$60,000. *The effects of 1 week of creatine supplementation on anaerobic capabilities and muscle strength*. General Nutrition Company (GNC), Pittsburgh, Pennsylvania, (awarded, GNC-2009-001A; P.I.: Terry J. Housh, PhD). **Completed.**
- 2008 (Fall) Co-Investigator - \$90,000. *The Effects of Two Different Arginine Based Formulations on the Physical Working Capacity at Neuromuscular Fatigue Threshold*. General Nutrition Company (GNC), Pittsburgh, Pennsylvania, (awarded, GNC-2008-007; P.I.: Terry J. Housh, PhD). **Completed.**
- 2008 (Spring) Co-Investigator - \$45,000. *The Acute Effects of TPB™ on Endurance Performance and Muscular Strength*, General Nutrition Company (GNC), Pittsburgh, Pennsylvania, (awarded, GNC-2008-001B; P.I.: Terry J. Housh, PhD). **Completed.**
- 2007 (Fall) Co-Investigator - \$30,000. Extension Arm to Spring 2007 study: *The effects of a calorie dense high protein supplement on body composition and exercise performance during resistance training*. General Nutrition Company (GNC), Pittsburgh, Pennsylvania, (awarded, GNC-2006-008; P.I.: Terry J. Housh, PhD). **Completed.**

Student Mentoring Grant Summary Table

Status	Number (#)	Amount (\$)
Pending Grants	0	0
Ongoing Grants	5	25,000
Completed	13	61,000
Not Funded	1	5,000
In Preparation	0	0
Total	19	91,000

Student Mentoring Grant List

- 2018 (Spring) Mentor - \$5,000. Development and Testing of 3D Printed Prostheses, Orthoses, and Assistive Devices for Children and Adults Part V. The objective is to develop a wireless control system to allow pediatric patients to activate a shoulder prosthesis using facial muscles (i.e. eye blinking). GRACA. **Graduate student Walker Arce. Ongoing.**
- 2018 (Spring) Mentor - \$5,000. Development and Testing of 3D Printed Prostheses, Orthoses, and Assistive Devices for Children and Adults Part IV. The objective is to develop a voice controlled prosthetic system that would allow amputee patients to activate their arm using voice commands. GRACA. **Graduate student Will Picken. Ongoing.**
- 2018 (Spring) Mentor - \$5,000. Development and Testing of 3D Printed Prostheses, Orthoses, and Assistive Devices for Children and Adults Part III. The objective is to develop a Radio Frequency Identification (RFID) control system for our upper limb prostheses. GRACA. **Graduate student Andre Butler. Ongoing.**
- 2018 (Spring) Mentor - \$5,000. 3D Printed Prostheses Effects on Standing Posture in Unilateral Upper Limb Deficient Children. GRACA. **Graduate student Keaton Young. Ongoing.**
- 2018 (Spring) Mentor -\$5,000. Developing and Testing of a Low-Cost Upper Limb Exoskeleton for Stroke Patients. GRACA. **Graduate student Drew Dudley. Ongoing.**
- 2017 (Fall) Mentor - \$5,000. 3D Printed Prostheses for Children: A Tool to Monitor Upper Limb Movement Project Description. Capacitive touch control for 3D printed shoulder prosthesis. GRACA. **Graduate student James Pierce. Completed.**
- 2017 (Fall) Mentor - \$5,000. 3D Printed Prostheses: Collaborative work with Chile. Adaptive devices. GRACA. **Graduate student Nick Than. Not funded.**
- 2017 (Spring) Mentor - \$4,000. Development and Testing of 3D Printed Prostheses, Orthoses, and Assistive Devices for Children and Adults Part I. Wireless control for hand exoskeleton. FUSE. **Undergraduate student Walker Arce. Completed.**
- 2017 (Spring) Mentor - \$4,000. Develop custom printed circuit board for a 3D scanner arm. NASA NE Space Grant Fellowships. **Undergraduate student Walker Arce. Completed.**
- 2017 (Spring) Mentor - \$2,000. Anatomical Modeling for Pre-Surgical Planning. NASA NE Space Grant Fellowships. **Graduate student Drew Dudley. Completed.**

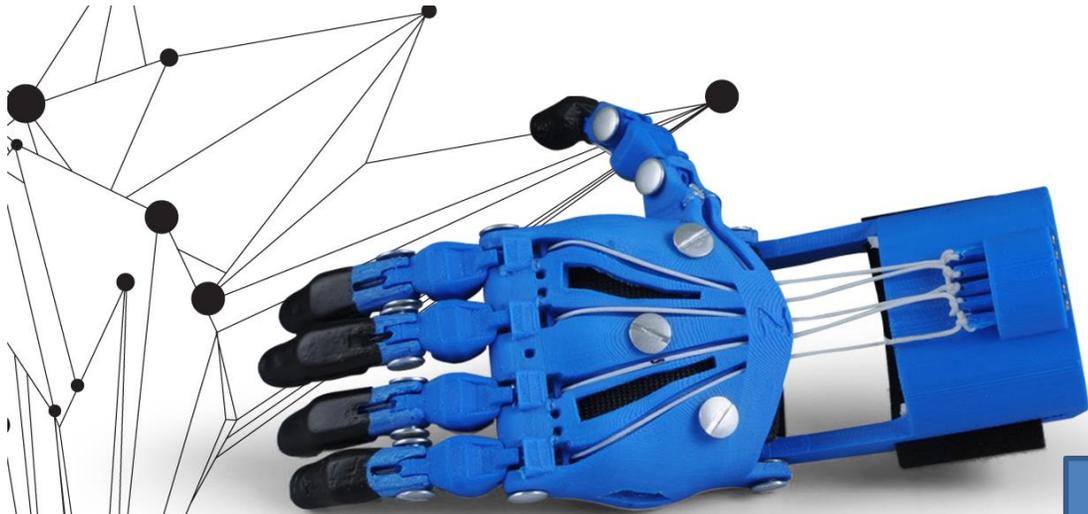
- 2016 (Fall) Mentor - \$2,000. 3D Printed Prostheses for Children: A Tool to Monitor Upper Limb Movement. NASA NE Space Grant Fellowships. **Graduate student James Pierce. Completed.**
- 2016 (Spring) Mentor -\$4,000. Practical file manipulation methodology to convert ultrasound images into a 3D printed object. NASA NE Space Grant Fellowships. **Undergraduate student Zoe Reed. Completed.**
- 2016 (Spring) Mentor - \$4,000. Additive Manufacturing for the Health Professional. NASA NE Space Grant Fellowships. **Medical student Joey Bowens. Completed.**
- 2015 (Fall) Mentor - \$15,000. *NASA NE Space Grant Fellowships 2015-2016*. NASA NE Space Grant Fellowships. **Ryan Smith, Alexandra Maliha, Margaret Fleita, & Margaret Griffin. Completed.**
- 2014 (Fall) Mentor - \$1,500. *Low-Cost 3D Printed Assistive Devices for Astronauts*. NASA Nebraska Space Grant & EPSCoR offices. **Undergraduate student Mark Petrykowsky. Completed.**
- 2014 (Fall) Mentor - \$2,500. *Gender Differences in Muscle Function and Neuromuscular Fatigue Thresholds*. NASA Nebraska Space Grant & EPSCoR offices. **Undergraduate student Joe Lesnak. Completed.**
- 2013 (Fall) Mentor - \$4,000. *New Submaximal Fatigue Threshold Tests for Muscular Function*. NASA Nebraska Space Grant & EPSCoR offices. **Undergraduate student Chelsie James. Completed.**
- 2013 (Fall) Mentor - \$4,000. *The Effect of Muscle Temperature in Neuromuscular Fatigue Thresholds*. NASA Nebraska Space Grant & EPSCoR offices. **Undergraduate student Mathew Buback. Completed.**
- 2013 (Fall) Mentor - \$4,000. *Neuromuscular, Metabolic, and Muscle Morphology Contributions to Fatigue of the Quadriceps between Individuals with and without a History of Knee Injuries*. NASA Nebraska Space Grant & EPSCoR offices. **Undergraduate Student Elizabeth Bracciano. Completed.**

HONORS AND AWARDS

- Tech Innovator of the Year for AIM's 2015 Tech Celebration Awards. The Tech Innovator of the Year Award is presented annually to one creative, outside-the-box individual that has demonstrated significant innovation in our community.
- Distinguished Promising Professional Award from the University of Nebraska at Omaha (2015).
- Best Inventions of 2014: Top 5 "Cyborg Beast" Low cost Prosthetic Hand, [By MSN, The Microsoft Network](#)
- Creator and designer of low-cost prosthetic devices for children "Cyborg Beast" (2013 to present)
- Innovator Award: Research in Biomechanics and 3D printed prosthetics. Sunshine Rehabilitation Hospital, First Rehabilitation Hospital, and University of Tongji Shanghai, China. (May 8, 2017). **[Connection to other APEC member economies]**
- [Social Innovation Award](#): Universidad de Viña del Mar, Valparaiso, Chile (August 8 2016) **[Connection to other APEC member economies]**
- [Congreso del Futuro](#): (The congress of the future). Social impact of new technologies award. Organized by the Chilean government and presented nationwide. **[Connection to other APEC member economies]**

- Minority Scholarship from the National Strength and Conditioning Association Foundation (2009-2010).
- Member of The Association of Children's Prosthetic-Orthotic Clinics
- Member of the review panel of the 2016 Peer Reviewed Orthopaedic Research Program (PRORP) for the Department of Defense Congressionally Directed Medical Research Programs (CDMRP).

Mass Media Appendix



LA REVOLUCIÓN
DE LA IMPRESIÓN **3D**

3D Printed Prostheses for Children

UNIVERSITY OF
Nebraska
Omaha

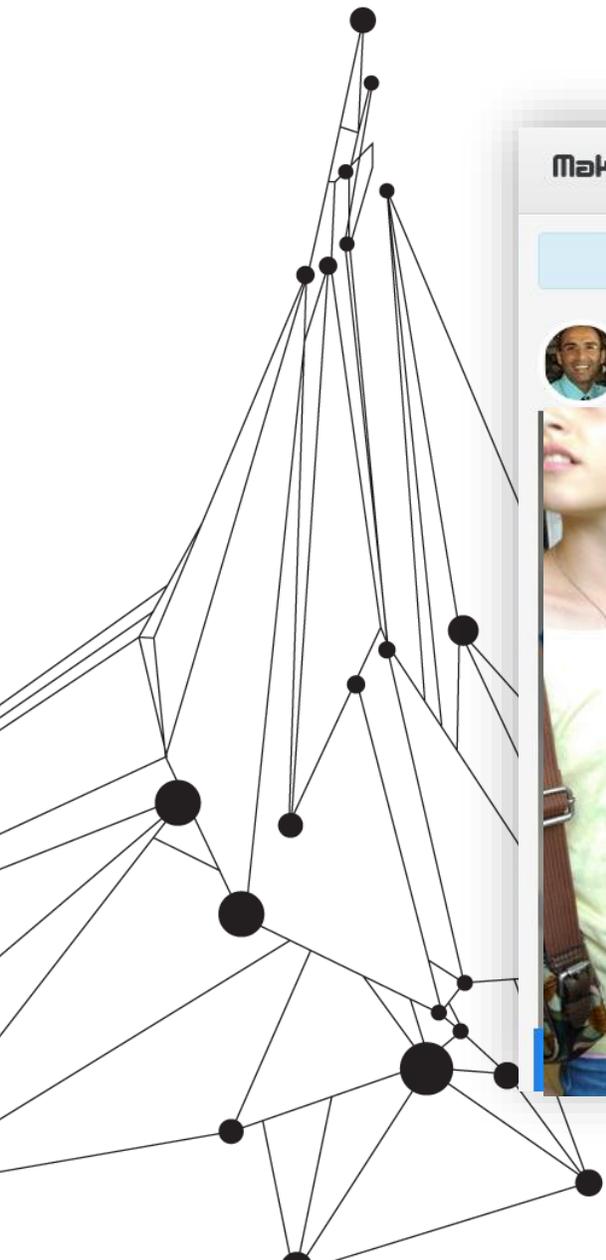
Jorge M. Zuniga Ph.D.



Department of Biomechanics
Biomechanics Research Building
3D Printed Prosthetic, Orthotic & Assistive Devices
University of Nebraska at Omaha | coe.unomaha.edu/brb
Email: jmzuniga@unomaha.edu
Website: <http://www.cyborgbeast.org/>



AN OPEN AND FREE DESIGN



MakerBot Thingiverse

DASHBOARD

EXPLORE

CREATE

Q Enter a search term

SIGN IN / JOIN

Hey! This thing is still a Work in Progress. Files, instructions, and other stuff might change!



Cyborg Beast

by JorgeZuniga, published Mar 2, 2014



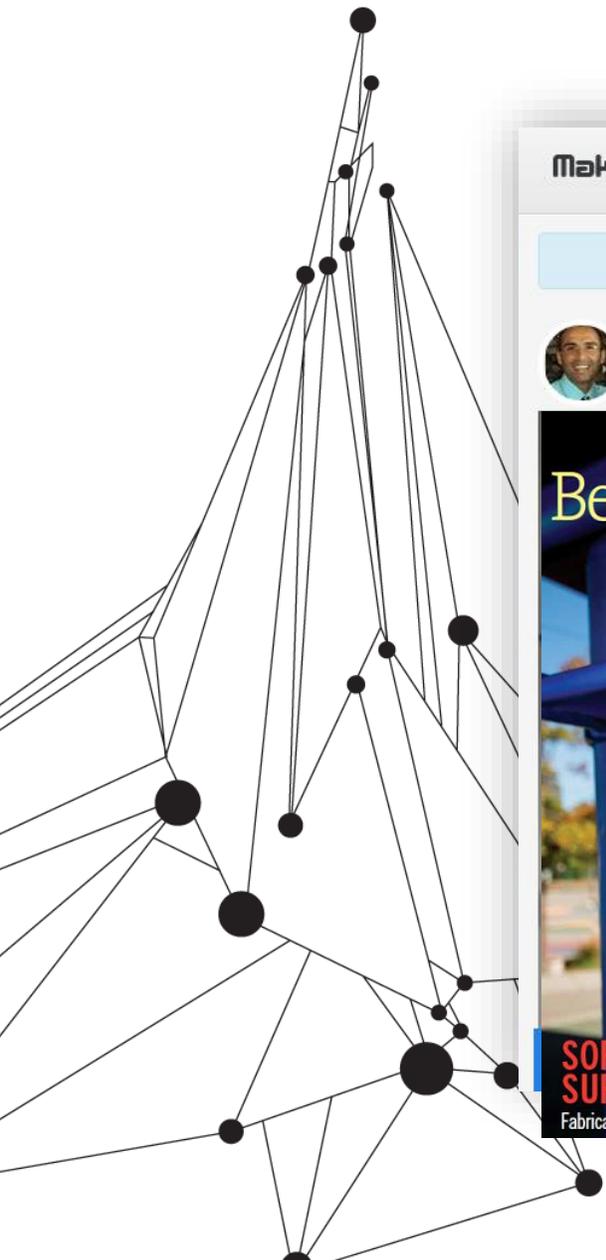
Stats

- **185,796** people have visit our webpage
- **46,085** people have downloaded our design.
- **16** medical and educational institutions have used and modified our design
- **More than 3,000** families around the world have printed a hand for their child.

Share

Download This Thing!

AN OPEN AND FREE DESIGN



MakerBot Thingiverse

DASHBOARD

EXPLORE

CREATE

Q Enter a search term

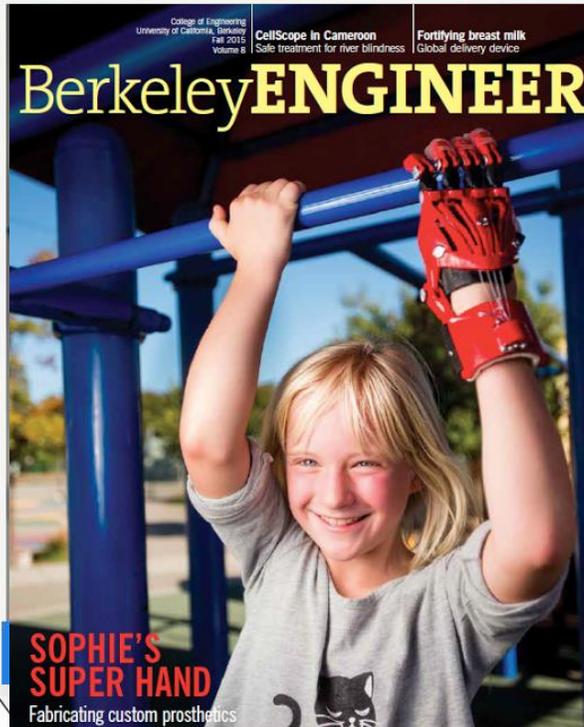
SIGN IN / JOIN

Hey! This thing is still a Work in Progress. Files, instructions, and other stuff might change!



Cyborg Beast

by JorgeZuniga, published Mar 2, 2014

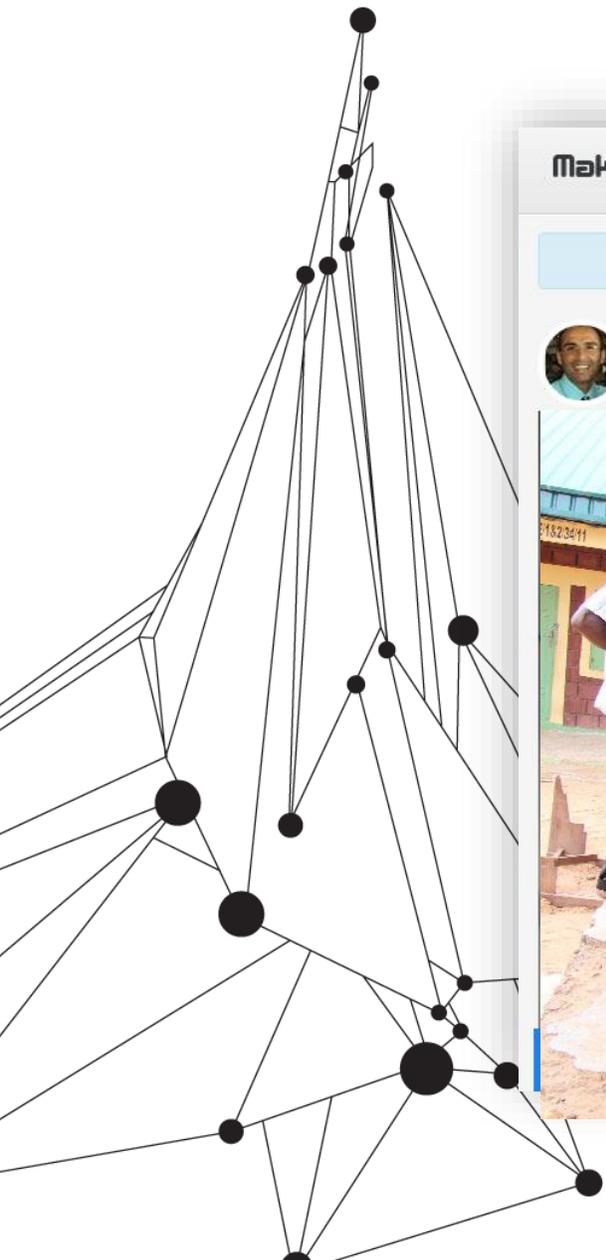


Our research group collaborates with organizations all over the world including Unicef, United Nations, Enabling the Future, CyberLogic, Berkeley Engineering, Johns Hopkins, NASA, NIH, Teleton-Chile, Universidad de Concepcion-Chile, Hospital de Trabajador (Chile), Children's Merci, and other national and international institutions.

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MakerBot Thingiverse

DASHBOARD

EXPLORE

CREATE

Q Enter a search term

SIGN IN / JOIN

Hey! This thing is still a Work in Progress. Files, instructions, and other stuff might change!



Cyborg Beast

by JorgeZuniga, published Mar 2, 2014



www.enablingthefuture.org
Courtesy of CyberLogik Foundation



I Made One

18

Remix It

12

Share



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AN OPEN AND FREE DESIGN

U.S. Department of Health and Human Services — National Institutes of Health

NIH NIH 3D Print Exchange DISCOVER

Cyborg Beast (Original Design)

Submitted by: [Creighton Lab](#)

Sun, 2014-08-10 18:15

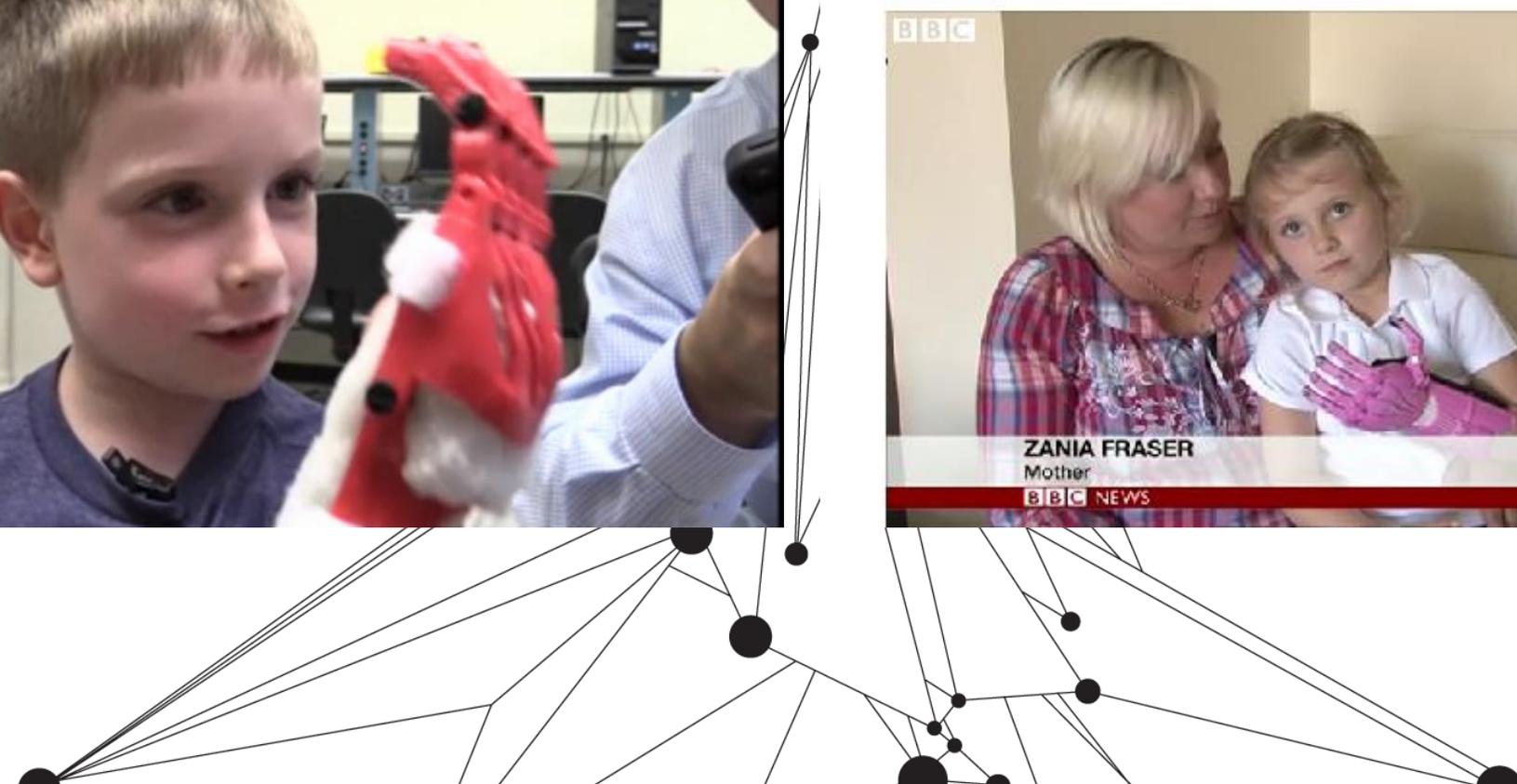




CNN iReport



NEWS HEALTH





By Melissa
Fry
BIO »

Professor's software, design gives boy hand

UPDATED 10:32 PM CDT Oct 30, 2013



SHOW TRANSCRIPT »

OMAHA, Neb. — A Creighton University professor is making a boy's dream a reality by making him a prosthetic hand.

<http://www.ketv.com/news/professors-software-design-gives-boy-hand/22724870>



Creighton Professor's 3D Printed Arms Changing Lives

Updated: Mon 9:00 PM, Apr 13, 2015

By: Matthew Smith - Email



<http://www.wowt.com/home/headlines/Creighton-Professors-3D-Printed-Arms-Changing-Lives-299633611.html>

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JORGE ZÓRIGA, EL CHILENO TRAS ESTA TECNOLOGÍA

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“Las proyecciones en el área biomédica son enormes”

El chileno Jorge Zúñiga desarrolló en Estados Unidos la idea de una mano protésica de bajo costo para niños gracias a la tecnología de impresión 3D.

POR ISABEL PLAZA VASQUEZ
isabel.plaza@diarioelsur.cl

Las grandes ideas a veces vienen en momentos inesperados. Así fue para Jorge Zúñiga, director del 3D Research & Innovation Laboratory de Creighton University en Estados Unidos, quien desde hace 15 años vive en ese país y que hace casi tres años iba camino a su hogar, cuando escuchó una entrevista en la radio que marcó sus siguientes meses.

“Escuché sobre una persona que estaba haciendo manos protésicas en Sudáfrica. Después vi el reportaje y la mano protésica que estaban haciendo, y por mis conocimientos en fisiología y biomecánica entendí que no iba a funcionar muy bien”, explica el académico, añadiendo que decidió dedicar los tres meses de vacaciones de la universidad a desarrollar el proyecto, teniendo como principal objetivo el bajo costo del implemento.

Estaba decidido a crearla lo más real posible, cuando su hijo le hizo un observación que cambió todo. “Me preguntó si era para niños, le dije que sí y me dijo ‘Papá, no creo que los niños quieran una mano que no es real, pero que se ve real. Si vas a hacer una mano mejor que se vea mejor que una real. Entonces me trajeron unos robots de Transformers y de ahí salió la idea de Cyborg Beasts”, relata.

Profesor de Fisiología y Biomecánica Humana en la misma universidad, Zúñiga recuerda que diseñaron la mano y pidieron opiniones de los departamentos de Kinesiología, Medicina y Terapia Ocupacional, pero la mayoría pensó que no iba a funcionar mucho porque se trataba de un modelo muy “low tech”, es decir, de pocos componentes electrónicos. Pese a ello, tuvo una oferta de una

compañía biomédica para desarrollarlo como un producto, pero junto a su esposa e hijo optó por mantener el trabajo a nivel de investigación universitaria. “Esto debía ser algo que se publicara, había que seguir la filosofía de lo que se había hecho antes y ese mismo día la pusimos online en un website desde donde la gente puede tomar el diseño y bajarlo”, señala. Luego se creó la organización Enabling the future, dedicada a distribuir el diseño, y desde entonces el modelo se ha ido masificando y también mejorando, gracias a la posibilidad de que otras universidades e instituciones bajen el diseño y lo trabajen para introducir cambios.

RECONOCIMIENTO

Actualmente, Zúñiga cuenta con financiamiento de la universidad en el laboratorio que lidera, además del apoyo de un equipo médico dedicado a diseñar y probar las manos ortopédicas. Hace unos días participó en el Octavo Congreso de Ingeniería Civil Biomédica de la Universidad de Concepción, donde no sólo contó su experiencia en el área, sino que además pudo conocer de cerca el valioso trabajo que se está realizando en la entidad.

—¿Por qué optó por trabajar con prótesis de niños?

—En Estados Unidos el 95% de todo el financiamiento de esta área está enfocado en veteranos de guerra, pero somos de los pocos que nos dedicamos a la protésica para niños y son quienes lo necesitan más que cualquier persona. Tenemos la suerte de que Nasa nos financia las investigaciones y estamos en proceso de investigación de manos, brazos y hombros.



Investigador estuvo en la Universidad de Concepción. Destacó trabajo realizado.

—El material que se usa es básicamente plástico, ¿qué tan durable es?

—Lo que pasa es que hay una limitación en la tecnología 3D, que es la durabilidad de los materiales, ya que se usa plástico. Son dos los más usados, el PLA, que es ácido poliláctico, y el ABS, que es un poco como el material de Lego. No es muy durable y ése es uno de los desafíos. Un niño de 6 años ocupa una de estas manos y por lo general después de dos o tres meses requiere ajustes, que en todo caso son muy baratos de realizar. Una

mano de este tipo se puede hacer por unos 50 dólares como máximo, y las prótesis tradicionales con gancho llegan a costar entre 1.000 a 1.500 dólares en Chile.

—¿Cómo ha sido el proceso de haber dejado el diseño a disposición pública? ¿Cuál ha sido el impacto?

—Fue importante, porque eso me conectó con más expertos y fue la primera mano protésica puesta online en Estados Unidos, abierta al público. En una

semana ya teníamos como mil descargas. Después, los padres empezaron a poner fotos de las manos de sus hijos usándolas y otras instituciones tomaron esa mano y trabajaron con ella. Esa es la idea, que las personas puedan tomarla, cambiarla y volver a publicarla, para seguir compartiéndola.

—Ese trabajo se está realizando también en la zona, ¿cómo ve la labor que se desarrolla localmente?

—Es increíble el trabajo que están haciendo en Concepción, lo que están haciendo en la UdeC está en las fronteras del avance científico, tomaron la mano y le pusieron microcontroladores, hicieron un pulgar oponible, es genial. Por lo general no viajó mucho, pero cuando supe que eran ellos y lo que estaban haciendo, dije que sí. Es un tipo de habilidades que tienen en la carrera, ya que nosotros no tenemos esas habilidades de ingeniería. Además, tiene el valor de estar en Concepción, porque acá todo viene de Santiago, cuando entendí el nivel de trabajo que están haciendo acá me impresionó mucho.

—En este sentido, ¿cuáles son las proyecciones de esta área? ¿Cómo la ve en los próximos años?

—Las proyecciones de este trabajo son enormes. Dentro de los dos próximos años National Institutes of Health, NIH, invertirán dos billones de dólares en aparatos biomédicos que ayuden a las personas con discapacidades y en la línea principal están los 3D. Estamos preparando aplicaciones y financiamiento, y la investigación que se está haciendo inevitablemente va a llegar a Chile y con lo que ya se está haciendo acá, inevitablemente el gobierno, en algún momento, va a tener que considerar el financiamiento para tener personas trabajando en el tema.

—De acuerdo a lo que señala, el trabajo que se está haciendo es excepcional, ¿falta valorar esos avances?

—Lo que pasa es que acá se glorifica mucho lo extranjero, de lo que se hace en avances tecnológicos, pero lo local es comparable y hasta superior de lo que se está haciendo en algunos lugares en el extranjero. Debe haber un respaldo al trabajo que se está realizando, con el fin de que no sólo tengan financiamiento, sino también reconocimiento, no sólo a través de los medios de comunicación, sino también de las instituciones especializadas.



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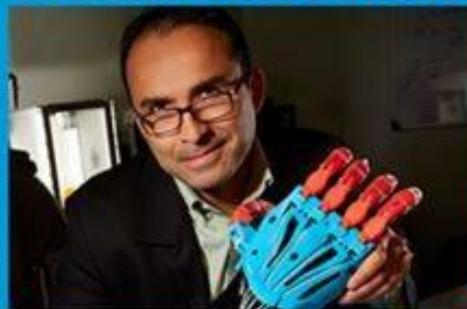


INVITADO ESPECIAL

Jorge Zúñiga, Ph. D

Director Laboratorio de Innovación en 3D
Universidad de Creighton, USA.

Master of Science University of Nebraska Omaha,
Ph.D University of Nebraska-Lincoln.



Jorge nos hablará de cómo la tecnología de impresión 3D está siendo usada para la creación y el desarrollo de prótesis de bajo costo.

Junto a su equipo, están liderando una revolución a nivel mundial. Su creación, el **Cyborg Beast** fue nombrado uno de los **mejores inventos de 2014** por MSN.com, y ha sido objeto de estudio de la Asociación Americana de Prótesis, y de organismos como la **NASA**.

The New York Times

SCIENCE

Hand of a Superhero

3-D Printing Prosthetic Hands That Are Anything but Ordinary

By JACQUELINE MROZ FEB. 16, 2015



http://www.nytimes.com/2015/02/17/science/hand-of-a-superhero.html?_r=0

SCIENTIFIC AMERICAN™

Need a Hand? Now You Can Print One

By Judy Stone | March 6, 2014 |



Shea - heart

“Every 4 1/2 minutes, a baby is born with a birth defect.” That translates to 1 of just 33 babies being born with a defect in the U.S. Of these, about 1,500 babies, or 4 out of every 10,000 babies are born missing a hand or arm (“upper limb reduction”). While crude replacements have been available for several hundred years, there has been a revolution in the past few years in producing prosthetic devices. Due primarily to the simultaneous advents of the DIY Maker Movement and the development of affordable 3D printers, costs have come down by orders of magnitude, and functionality has exploded.

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Creighton graduate and faculty member recognized for major prosthetic advances

By CHERIL LEE • DEC 3, 2015

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Not many people are aware that a small lab in Nebraska is at the forefront of 3D printing prosthetic evolution.

Dr. Jorge Zuniga, Director of [Creighton University's](#) 3D Research & Innovation Laboratory and his research lab assistant, Creighton alum Adam Carson, received AIM Tech awards for the major prosthetic advances they've made.

Zuniga says standard devices are typically expensive, heavy, and not customizable. He says he and his staff specialize in making low-cost 3D printed prosthetic devices for children.



<http://kios.org/post/creighton-graduate-and-faculty-member-recognized-major-prosthetic-advances>

Top 5 Invention of 2014



CYBORG BEAST

In many parts of the world, high-end prosthetics are financially unfeasible. But now, thanks to Jorge Zuniga and his researchers at Creighton University, a new hand is as close as the nearest 3D printer. The Cyborg Beast is printed on ABS plastic and is licensed under the Creative Commons-Attribution-Non-Commercial license. And if you break a finger? Print a new one.

<http://www.msn.com/en-us/news/bing/best-inventions-of-2014/ss-BBgPUsR#image=5>

Congratulations!

Congratulations! to the 2015 AIM Tech Celebration Award Honorees!



The 2015 AIM Tech Celebration Award Recipients

Tech Innovator of the Year – Jorge M. Zuniga Ph.D., Creighton University



Tech Innovator:

Jorge M. Zuniga Ph.D.

Creighton University
Director, 3D Research and
Innovation Lab and
Assistant Professor, Dept. of
Exercise Science

Cultura

Jorge Zúñiga, el científico chileno que cambió el mundo con sus prótesis 3D

por CULTURA+CIUDAD, EL MAGAZINE DE EL MOSTRADOR | 28 diciembre 2015



Oriundo de El Bosque y ex alumno de un colegio técnico en La Pintana, este doctor en Fisiología Biomecánica ha provocado una verdadera revolución al crear la "Cyborg Beast", la única mano biomecánica

<http://www.elmostrador.cl/cultura/2015/12/28/jorge-zuniga-el-cientifico-chileno-que-cambio-el-mundo-con-sus-protesis-3d/>

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World-Herald editorial: Creighton shares technology with all

Kudos to Creighton University. Its 3-D Research & Innovation laboratory produces affordable, 3-D-printed prosthetic hands and makes open-source software available on the Internet to help others do the same. An innovative approach, in terms of science as well as generosity of spirit.

[Read more...](#)

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http://www.omaha.com/opinion/world-herald-editorial-creighton-shares-technology-with-all/article_6f8cacd7-37c8-57ed-a8da-8f4a7fbe2705.html



Creighton graduate and faculty member recognized for major prosthetic advances

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**Científico
chileno top
creó manos
ortopédicas
para niños
por \$35.000**

Jorge Zúñiga
expondrá en el
Congreso del
Futuro



**Debutó Beccacece:
las siete diferencias
entre él y Sampaoli** 42

**Begoña Basauri abre
el debate: ¿Cuál es el
bikini perfecto?** 52



Jorge Zúñiga creció en la comuna de El Bosque y tuvo una infancia difícil. De esa época recuerda: "La plata siempre fue un tema en mi vida. Cuando le hablaba a Dios, le decía que por favor me sacara el peso de depender de la plata. Le pedía que me solucionara ese factor para tener la libertad de hacer lo que yo quería".

La buena mano de un CIENTÍFICO CHILENO

Jorge Zúñiga creó la Cyborg Beast, una mano biomecánica de bajo costo: apenas 35 mil pesos, que hoy se prueba en instituciones como la Teletón. Un laboratorio le hizo una oferta millonaria por su invento, pero él no solo la rechazó, sino que subió los planos a internet para que cualquiera tuviera acceso. Acá, habla de cómo sobrevivió a una infancia llena de carencias, por qué se fue a Estados Unidos sin saber una palabra en inglés y de qué manera se hizo un lugar en el mundo académico.

FOTO SERGIO LÓPEZ I.

El 1 de marzo de 2014, Jorge Zúñiga, chileno, 36 años, casado, dos hijos, llegó a su casa en Lincoln, en el estado de Nebraska, con la mejor noticia del mundo: un laboratorio internacional le había hecho una oferta millonaria por los derechos de una prótesis de mano para niños que había inventado. Su creación tenía una ventaja adicional: en el mercado algunas cuestan hasta cinco millones de pesos, pero la Cyborg Beast – así la bautizó – costaba solo 35 mil.

Zúñiga cuenta que la oferta incluía una cláusula importante: que él, profesor de educación física de la Universidad Cardenal Raúl Silva Henríquez, magister en Ciencias del Ejercicio y doctor en Fisiología y Biomecánica Humana, trabajara con ellos por un año y que no volviera a hacer investigaciones sobre prótesis de mano en los próximos cinco años. Dice que, además, le ofrecieron un sueldo mensual que quintuplicaba su salario y que, al terminar, le entregarían un bono de dos millones de dólares.

–Me tenté –dice ahora, durante una visita a Chile, invitado por la Universidad Santo Tomás–. Esa tarde llegué a mi casa diciéndole a mi señora que nos íbamos a ir de vacaciones al Caribe, que era nuestro sueño. Y a mi hijo, que le iba a comprar una bicicleta y todo lo que quisiera.

Pero entonces, agrega, ocurrió algo que lo hizo cambiar de idea: su hijo, de 6 años, quien le había dicho que hiciera una mano parecida a las partes de los Transformers, para que fuera más entretenida, y que se entusiasmó cuando su padre le contó que iba a ser tan barata que le iban a poder usar hasta los niños más pobres de África, le preguntó:

“¿Qué pasará entonces con los niños que no tienen mano?”.

–La mayoría de esas investigaciones se guardan en un cajón y nunca ven la luz. Muchas veces los laboratorios pagan para que el mercado siga tal cual está –dice Jorge Zúñiga.

Entonces tomó una decisión. Sin decirle a nadie, ese día, a la medianoche, subió a la web toda su investigación sobre la mano ortopédica para niños en impresión 3D, incluyendo planos e informes. Así, quien quisiera armarla simplemente podría bajar la información.

–¿Por qué lo hizo?

–Es que uno es humano. Yo no me quería tentar de nuevo con la plata.

El niño pobre

–Nosotros éramos bien pobres –dice Zúñiga.

Nació en la comuna de El Bosque, su mamá hacía aseo en distintas empresas –hoy lo hace en el Registro Civil–, y su padre trabajaba en la mantención del recinto deportivo de la Fuerza Aérea. Cursó la enseñanza media en un liceo politécnico, siempre tuvo buenas notas, pero en su familia no pensaban que él podría llegar a ser un profesional.

–Es algo social: vivíamos en un estrato socioeconómico bajo y uno hace o se dedica a lo que uno ve, porque no sabe que hay cosas más grandes. Yo nunca supe que existía, por ejemplo, un magister. Con suerte sabía de la universidad. Mi papá menos.

Zúñiga practicaba mucho deporte, gracias al trabajo de su padre.



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Beauty & the Cyborg Beast

Bioprinting Prosthetic Dreams for Children

August 26, 2016 by [Charlie Litton](#)

Photography by [Bill Sitzmann](#)



\$150,000 investment will allow UNO researcher to improve 3-D-printed prosthetic hand for children

By Rick Ruggles / World-Herald staff writer Jul 18, 2017 (0)



Dr. Jorge Zuniga, from left, prepares Adam Gray, 13, to do some exercises with his 3-D-printed prosthetic hand while monitoring his brain waves with grad assistant James Pierce and electrical computer engineering undergrad Walker Arce.

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