

# Kota Z. Takahashi, Ph.D.

(revised 09/2021)

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[Google Scholar Site](#)

## Education

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**Postdoc**, Biomedical Engineering Nov 2012 – Jun 2015  
**University of North Carolina at Chapel Hill and North Carolina State University** (Raleigh, NC)  
Advisor: Gregory S. Sawicki

**Ph.D.**, Biomechanics & Movement Science Interdisciplinary Program Jan 2008 – Aug 2012  
**University of Delaware** (Newark, DE)  
Advisor: Steven J. Stanhope  
Dissertation: “Total Power Profiles of Anatomical and Prosthetic Below-Knee Structures”

**M.BE.**, Biomedical Engineering Sep 2006 – Dec 2007  
**Catholic University of America** (Washington D.C.)

**B.S.**, Movement Science Sep 2002 – May 2006  
**University of Michigan** (Ann Arbor, MI)

## Academic Positions

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**Assistant Professor – University of Nebraska at Omaha** Aug 2015 - present  
Center for Research in Human Movement Variability  
Department of Biomechanics (Omaha, NE)

**Postdoctoral Scholar – North Carolina State University** Nov 2012 – Jul 2015  
Human Physiology of Wearable Robotics (PoWeR) Laboratory - PI Gregory Sawicki  
Joint Department of Biomedical Engineering, North Carolina State University & University of North Carolina  
at Chapel Hill (Raleigh, NC)

**Graduate Research Assistant – University of Delaware** Jan 2008 – Aug 2012  
Human Performance Laboratory  
Biomechanics & Movement Science Interdisciplinary Program (Newark, DE)

## Research Interests

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Foot and Ankle Biomechanics  
Locomotion Energetics (e.g., Mechanics, Metabolic, Thermal)  
In-vivo Muscle-Tendon Mechanics  
Rehabilitation & Clinical Gait Analysis (e.g., Limb Amputation, Aging, Diabetes)  
Prosthetics, Orthotics, Exoskeletons, Footwear

## Honors/Awards

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NIH TIGRR (Training in Grantsmanship in Rehabilitation Research) Fellow 2020  
Best Clinical Impact Award, Human Movement Variability Conference 2019  
Best Podium Presentation, Gait and Clinical Movement Analysis Society 2017  
Top 4 Finalist for Best Paper Award, Gait & Posture 2017  
Top 11 Finalist for Clinical Biomechanics Award, American Society of Biomechanics 2013  
Professional Development Award (\$900.00), Office of Postdoctoral Affairs, North Carolina State University  
Higher Education Teaching Certification, Center for Teaching and Learning, University of Delaware 2012  
Dr. Kevin Granata Young Investigator Award (\$1,000.00), Gait and Clinical Movement Analysis Society 2011  
Student Travel Scholarship (\$350.00), Gait and Clinical Movement Analysis Society 2011  
Student Travel Scholarship, Lilly Conference on College & University Teaching 2011  
Study Abroad Scholarship, Office of International Programs at University of Michigan 2005

## Publications

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### *Peer-Reviewed Manuscripts:*

27. Gutierrez J, Wilkins S, Burcal C, **Takahashi KZ**, Rosen A. Intra- and inter-rater reliability of novice clinician users of diagnostic ultrasound to assess anterior talofibular ankle ligament length. *Athletic Training & Sports Health Care* (accepted)
26. Krupenevich RL, Ray SF, Kashefsky HE, **Takahashi KZ**, and Franz JR. Effects of age and locomotor demand on foot mechanics during walking. *Journal of Biomechanics*, 2021, 123:110499
25. Gonzalez A, Pineda-Gutierrez AL, Kern AM, and **Takahashi KZ**. Association between foot thermal responses and shear forces during turning gait in young adults. *PeerJ*, 2021, 9:e10515
24. Nuckols RW, **Takahashi KZ**, Farris DJ, Mizrachi S, Riemer R, and Sawicki GS. Mechanics and energetics of walking and running up and downhill: A joint-level perspective to guide design of lower-limb exoskeletons. *PLOS One*, 2020, 15(8): e0231996
23. Papachatzis N, Malcolm PM, Nelson CA, and **Takahashi KZ**. Walking with added mass magnifies salient features of human foot energetics. *Journal of Experimental Biology*, 2020, 223: jeb207472
22. Ray SF, and **Takahashi KZ**. Gearing up the human ankle-foot system to reduce energy cost of fast walking. *Scientific Reports*, 2020, 10(1): 8793
21. Meade Z, Marmelat V, Mukherjee M, Sado T, and **Takahashi KZ**. Comparison of a portable balance board for measures of persistence in postural sway. *Journal of Biomechanics*, 2020, 100: 109600
20. Hedrick EA, Malcolm P, Wilken JM, and **Takahashi KZ**. The effects of ankle stiffness on mechanics and energetics of walking with added loads: A prosthetic emulator study. *Journal of NeuroEngineering and Rehabilitation*, 2019, 16 (1): 148
19. Kern AM, Papachatzis N, Patterson JM, Bruening DA and **Takahashi KZ**. Ankle and midtarsal joint quasi-stiffness when walking with added mass. *PeerJ*, 2019, 7:e7487

## Kota Z. Takahashi – Curriculum Vitae

18. Kent JA, Sommerfeld JH, Mukherjee M, **Takahashi KZ**, and Stergiou N. Locomotor patterns change over time when exposed to an uneven surface. *Journal of Experimental Biology*, 2019, 222: jeb202093
17. Hedrick EA, Stanhope SJ, and **Takahashi KZ**. The foot and ankle structures reveal emergent properties analogous to passive springs during human walking. *PLoS One*, 2019, 14(6): e0218047
16. Kent JA, **Takahashi KZ**, and Stergiou N. Uneven terrain exacerbates the deficits of a passive prosthesis in the regulation of whole body angular momentum in individuals with a unilateral transtibial amputation. *Journal of NeuroEngineering and Rehabilitation*, 2019, 16: 25
15. Rock CG, Wurdeman SR, Stergiou N, and **Takahashi KZ**. Stride-to-stride fluctuations in transtibial amputees are not affected by changes in push-off mechanics from using different prostheses. *PLoS One*, 2018, 13(10): e0205098
14. Rock CG, Marmelat V, Yentes JM, Siu K, and **Takahashi KZ**. Interaction between step-to-step variability and metabolic cost of transport during human walking. *Journal of Experimental Biology*, 2018, 12:22
13. Bruening DA, Pohl M, **Takahashi KZ**, and Barrios J. Midtarsal locking, the windlass mechanism, and running strike pattern: A kinematic and kinetic assessment. *Journal of Biomechanics*, 2018, 17:73, 185-191
12. Childers WL, and **Takahashi KZ**. Increasing prosthetic foot energy return affects whole-body mechanics during walking on level ground and slopes. *Scientific Reports*, 2018, 8: 5354
- \*11. Bruening DA, and **Takahashi KZ**. Partitioning ground reaction forces for multi-segment foot kinetics. *Gait & Posture*, 2018, 6:62: 111-116  
\*received nomination for Best Paper Award
10. Ray SF, Wurdeman SR, and **Takahashi KZ**. Prosthetic energy return during walking increases after 3 weeks of adaptation to a new device. *Journal of NeuroEngineering and Rehabilitation*, 2018, 15:6.
9. Ebrahimi A, Collins JD, Kepple TM, **Takahashi KZ**, Higginson JS, and Stanhope SJ. A mathematical analysis to address the 6 degree-of-freedom segmental power imbalance. *Journal of Biomechanics*, 2018, 3:66, 186-193
8. **Takahashi KZ**, Worster K, and Bruening DA. Energy neutral: the human foot and ankle subsections combine to produce near zero net mechanical work during walking. *Scientific Reports*, 2017, 7: 15404
- \*7. **Takahashi KZ**, Gross MT, van Werkhoven H, Piazza SJ, and Sawicki GS. Adding stiffness to the foot modulates soleus force-velocity behaviour during human walking. *Scientific Reports*, 2016, 6: 29870  
\*this article was featured on UNO website, WOWT (local TV station), KIOS (local radio station), and was chosen as 'Pick of the Week' on BIOMCH-L Literature Update:  
<http://www.unomaha.edu/news/2016/07/uno-researcher-finds-shoe-stiffness-impacts-energy-use.php>  
<http://kios.org/post/uno-led-study-looks-shoe-stiffness-and-energy-use#stream/0>  
<http://www.wowt.com/content/news/UNO-research-taking-steps-toward-a-more-sensible-shoe-388855402.html>
- \*6. **Takahashi KZ**, Lewek MD, Sawicki GS. A neuromechanics-based powered ankle exoskeleton to assist walking post-stroke: A feasibility study. *Journal of NeuroEngineering and Rehabilitation*, 2015, 12:23

## Kota Z. Takahashi – Curriculum Vitae

*\*this article was featured on UNO magazine:*

<http://www.unomaha.edu/news/2016/04/uno-magazine-from-basketball-to-biomechanics.php>

5. Zelik KE, **Takahashi KZ**, and Sawicki GS. Six degree of freedom analysis of hip, knee, ankle and foot provides updated understanding of biomechanical work during human walking. *Journal of Experimental Biology*, 2015, 218:6, 876-886
4. **Takahashi KZ**, Horne JR, and Stanhope SJ. Comparison of mechanical energy profiles of passive and active below-knee prostheses: a case study. *Prosthetics & Orthotics International*, 2015, 39:2, 150-156
3. **Takahashi KZ**, and Stanhope SJ. Mechanical energy profiles of the combined ankle-foot system in normal gait: insights for prosthetic designs. *Gait & Posture*, 2013, 38:4, 818-823
2. **Takahashi KZ**, Kepple TM, and Stanhope SJ. A unified deformable (UD) segment model for quantifying total power of anatomical and prosthetic below-knee structures during stance in gait. *Journal of Biomechanics*, 2012, 45:15, 2662-2667
1. **Takahashi KZ**, and Stanhope SJ. Estimates of stiffness for ankle foot orthoses (AFOs) are sensitive to loading conditions. *Journal of Prosthetics and Orthotics*, 2010, 22:4, 211-219

### *Manuscripts in Review:*

5. Kim H, **Takahashi KZ**, Grindstaff TL, and Rosen A. The effects of prolonged use of Kinesio Tape on static and dynamic postural control in individuals with chronic ankle instability. *Journal of Physical Therapy in Sports*.
4. Maun J, Gard SA, \*Major MJ, and \***Takahashi KZ**. Reducing pylon stiffness amplifies prosthesis energy loss and redistributes joint mechanical work during walking. *Journal of NeuroEngineering and Rehabilitation*  
*\*equal contributions*
3. Papachatzis N, Ray SF, and **Takahashi KZ**. Longer heels are associated with reduced metabolic cost of fast walking in humans. *Journal of Applied Physiology*
2. Sado T, Nielsen J, Glaister B, **Takahashi KZ**, Malcolm P, and Mukherjee M. Effects of passive exoskeleton assistance on spatio-temporal metrics of symmetry during the split-belt adaptation task. *Experimental Brain Research*
1. Browne M, Franz JR, **Takahashi KZ**, DiMeo AJ, and Sawicki GS. Effects of real-time biofeedback of the center of pressure on ankle joint mechanics during walking. *Journal of Biomechanics*

### *Manuscripts in Preparation (data collection complete) or Planned (collection on-going):*

3. Kern AM, Anguiano-Hernandez J, Bloomberg J, and **Takahashi KZ**. Validation of a semi-automated thermography-based method for quantifying regional foot temperature changes following locomotion. *IEEE Transactions on Biomedical Engineering* (in preparation)
2. Papachatzis N, Patterson JM, Franz JR, and **Takahashi KZ**. Foot mechanical work during human walking on incline and decline slopes. *Journal of Royal Society Interface* (in preparation)

## Kota Z. Takahashi – Curriculum Vitae

1. Papachatzis N, Slivka DR, Pipinos II, and **Takahashi KZ**. Can foot mechanical energy during walking be dissipated as heat? *Journal of Royal Society Interface* (in preparation)

### Grant Support

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#### *Current:*

**2. Department of Defense CDMRP OPOP** Aug 2021 – Jul 2024  
“Optimizing Prosthetic Shock Absorption for High Demand Mobility of Service Members with Leg Amputation”

Primary Investigators (Multi-PI): Takahashi KZ, Major MJ (Northwestern Univ.), and Kingsbury TV (Naval Medical Center San Diego)

Total Award: \$1,999,991

Aim: Examine the effect of prosthetic shock absorbing componentry on mobility outcomes in Service Members with leg amputation.

**1. University of Nebraska at Omaha Research Development Program** July 2020 – June 2022  
“Non-linear prosthetic ankle stiffness to improve locomotion in physically demanding tasks”

Primary Investigator: Takahashi KZ

Total Award: \$41,929 (funding for one doctoral assistant for two years)

Aim: Examine the effect of prosthetic stiffness profile on gait outcomes in individuals with a lower limb amputation.

#### *Completed:*

**15. National Science Foundation ITEST** Jan 2018 – Dec 2020  
“Biomechanics to Offer Diverse Young Minds Opportunities to Develop, Explore and Learn STEM (BODYMODELS)”

Primary Investigator: Grandgenett NF (UNO); co-PI Takahashi KZ

Total Award: \$1,199,939

Aim: To train local elementary school teachers on how to use Biomechanics as a platform to engage students in STEM.

**14. National Institute of Health INBRE Supplement** Sept 2019 – Aug 2020  
“Temperature-optimized exercise to enhance human health and muscle function”

Primary Investigator: Dustin Slivka (UNO); co-PI Takahashi KZ

Total Award: \$143,917

Aim: Determine the effects of local cooling and heating on muscle gene expression, muscle contractile mechanics and energetics during functional movement tasks.

**13. University of Nebraska at Omaha UCRCA Grant** May 2019 – Aug 2019  
“Database of Human Ankle-Foot Biomechanics to Facilitate Prosthetic Prescription”

Primary Investigator: Takahashi KZ

Total Award: \$5,000

Aim: To create a database of normal ankle-foot biomechanics to gain insights for prescription of prosthetic devices

**12. Nebraska System Science Collaboration Initiative Grant** Jul 2017 – Jun 2019  
“Foot Biomechanics and Thermoregulation in Diabetes and Peripheral Artery Disease”

## **Kota Z. Takahashi – Curriculum Vitae**

Primary Investigator: Takahashi KZ

co-PIs: Slivka D (UNO), Bashford G (UNL), Kamenskiy A (UNMC), Pipinos I (UNMC)

Total Award: \$150,000

Aim: Examine the link between foot biomechanics and thermodynamics in patients with diabetes and peripheral artery disease

### **11. Nebraska System Science Collaboration Initiative Grant**

Jul 2018 – Jun 2019

“Exoskeletons for Rehabilitation and Mobility Assistance”

Primary Investigator: Malcolm P (UNO); co-PI Takahashi KZ

Total Award: \$8,500

Aim: Create and strengthen a multi-disciplinary team of scientists within University of Nebraska, and identify research opportunities for exoskeleton-assisted rehabilitation

### **10. NASA Nebraska Space Grant**

Aug 2018 – Feb 2019

“A Thermography-Based Analysis to Understand Foot Temperature Regulation during Locomotion”

Primary Investigator: Kern A (UNO); co-PI Takahashi KZ

Total Award: \$15,421

Aim: To develop and validate a method for thermography-based analysis of human foot temperature

### **9. Center for Research in Human Movement Variability**

Jul 2017 – Jun 2019

“Foot Biomechanics and Thermoregulation in Diabetes and Peripheral Artery Disease”

Primary Investigator: Takahashi KZ

Total Award: \$196,000

Aim: Examine the link between foot biomechanics and thermodynamics in patients with diabetes and peripheral artery disease

### **8. Nebraska System Science Collaboration Initiative Grant**

Jul 2017 – Jul 2018

“Towards Optimal Prescription of Footwear for Enhanced Human Movement Performance”

Primary Investigator: Takahashi KZ

Total Award: \$4,000

Aim: Create and strengthen a multi-disciplinary team of scientists within University of Nebraska, and identify research opportunities for footwear design

### **7. NASA Nebraska Space Grant Mini-Grant**

Aug 2017 – Feb 2018

“Influence of Foot-Ground Traction on Optimality and Kinematic Execution of Gaits for Reduced Gravity”

Primary Investigator: Malcolm P (UNO); co-I Takahashi KZ

Total Award: \$24,092

Aim: To determine the effects of foot-ground interface properties on mechanics and energetics of locomotion.

### **6. NASA Nebraska Higher Education Mini-Grant**

Aug 2017 – Feb 2018

“Biomechanics for Engaging Students in STEM”

Primary Investigators: Takahashi KZ, Lanier A (UNO)

Total Award: \$23,743

Aim: To redesign an undergraduate Biomechanics class and implement community outreach activities to engage students in STEM

### **5. NASA Nebraska Space Grant Mini-Grant**

Aug 2017 – Feb 2018

“Robotic Variable Terrain Treadmill for Research and Rehabilitation”

Primary Investigator: Takahashi KZ, Vanderheyden T (UNO)

## **Kota Z. Takahashi – Curriculum Vitae**

Total Award: \$25,875

Aim: To develop a prototype treadmill to simulate a wide range of variable surface terrain

### **4. NASA Nebraska Higher Education Mini-Grant**

Aug 2016 – Apr 2017

“Enhancing Undergraduate Education with Biomechanics”

Primary Investigator: Takahashi KZ

Total Award: \$26,653

Aim: Determine whether software-based training of Biomechanics could improve learning outcomes in an undergraduate course

### **3. UNO Curriculum Development Grant**

Aug 2016 – Apr 2017

“Redesigning of Undergraduate Biomechanics Class”

Primary Investigator: Takahashi KZ

Total Award: \$1,000

Aim: Determine whether software-based training of Biomechanics could improve learning outcomes in an undergraduate course

### **3. Nebraska EPSCoR Major Research Instrumentation Program**

Aug 2016 – Jan 2017

Acquisition of OBJECT260 Connex3 for Research, Training and Outreach Activities

Primary Investigator: Zuniga J (UNO); co-PI Takahashi KZ

Total Award: \$190,095

Aim: To acquire a research-grade 3D printer to enhance research, training, and outreach activities

### **2. NASA EPSCoR Mini-Grant**

Feb 2016 – Aug 2016

“Locomotion on Dynamically Adaptive Terrain”

Primary Investigators: Takahashi KZ; Vanderheyden T (UNO)

Total Award: \$25,000

Aim: Examine the effects of a complex treadmill terrain on mechanics and energetics of locomotion

### **1. North Carolina State University – Rehabilitation Engineering Center Pilot Grant** Jul 2014 – Jun 2015

“Reverse-Engineering Human Musculoskeletal Design to Inform Rehabilitation of Ankle-Foot Pathologies”

Primary Investigators: Sawicki GS (NCSU), Gross MT (UNC Chapel Hill), Takahashi KZ

Total Award: \$25,000

Aim: Examine the role of foot mechanical properties on ankle muscle-tendon mechanics and whole-body metabolic cost during human locomotion.

### ***Pending Grant Support:***

### **3. National Science Foundation CAREER**

submitted Jul 2021

“CAREER: Biomechanics, vascular physiology and thermoregulation of human feet”

Primary Investigator: Takahashi KZ

Total Award: \$548,405

Aim: Determine the biomechanical and physiological factors that drive thermoregulation in human feet.

### **2. National Institute of Health – R01**

submitted Jan 2021

“Thermoregulation in individuals with a leg amputation: mechanics and vascular physiology factors to understand risks for tissue complications”

Primary Investigator: Takahashi KZ

Total Award: \$2,552,389

## Kota Z. Takahashi – Curriculum Vitae

Aim: Determine the influence of gait mechanics, vascular physiology, and prosthetic components on temperature responses in residuum tissue of individuals with a leg amputation.

Score: 39, 26<sup>th</sup> percentile (1<sup>st</sup> submission)

*\*Resubmission planned for September 2021.*

### 1. National Institute of Health – R01

submitted Feb 2020, Nov 2020

“The Role of Foot and Ankle Interaction Dynamics in Aging and Mobility: From Musculoskeletal Mechanisms to Clinical Translation”

Primary Investigators (Multi-PI): Franz JR (UNC Chapel Hill), Takahashi KZ

Total Award: \$2,848,784

Aim: Examine the functional interaction of foot and ankle structures and determine if carbon fiber insoles can enhance mobility in older adults.

Score: 42, 30<sup>th</sup> percentile (1<sup>st</sup> submission); 30, 13<sup>th</sup> percentile (2<sup>nd</sup> submission)

*\*New submission planned for October 2021 (if prior submission is not funded)*

### Grant Proposals (submitted – not funded):

#### National Science Foundation

submitted Jun 2020

“Non-linear prosthetic ankle stiffness to improve locomotion in physically demanding tasks”

Primary Investigators: Takahashi KZ, Jacobsen AL (Omaha VA)

Total Award: \$489,385

Aim: Examine the effect of prosthetic stiffness profile on gait outcomes in individuals with a lower limb amputation.

#### National Science Foundation CAREER

submitted Jul 2019

“CAREER: Human foot energetics and thermoregulation”

Primary Investigator: Takahashi KZ

Total Award: \$549,390

Aim: Determine the biomechanical factors that influence foot thermoregulation.

Score: Competitive (2<sup>nd</sup> submission)

#### National Institute of Health – R01

submitted Feb 2019

“Non-Linear Prosthetic Ankle Stiffness to Improve Locomotion in Physically Challenging Tasks”

Primary Investigator: Takahashi KZ

Total Award: \$1,707,444

Aim: Examine the effect of prosthetic stiffness profile on gait outcomes in individuals with a lower limb amputation.

Score: not discussed (1<sup>st</sup> submission)

#### National Institute of Health – R15

submitted Oct 2018

“Improving Locomotion in Physically Challenging Tasks Using a Non-Linear Prosthetic Ankle Stiffness”

Primary Investigator: Takahashi KZ

Total Award: \$419,522

Aim: Examine the effect of prosthetic stiffness profile on gait outcomes in individuals with a lower limb amputation.

Score: 52 (1<sup>st</sup> submission)

#### Nebraska EPSCoR First Award

submitted Oct 2018



## Kota Z. Takahashi – Curriculum Vitae

“Locomotion Energetics of the Human Foot”

Primary Investigator: Takahashi KZ

Total Award: \$49,978

Aim: Determine the fundamental structure-function relationships of the human foot and ankle during functional movement tasks

### Nebraska System Science Collaboration Initiative Grant

submitted Jan 2019

“Clinically Feasible Human-in-the-loop Design of Hip Exoskeletons for Patients with Peripheral Artery Disease”

Primary Investigators: Malcolm P (UNO); co-PI Takahashi KZ

Total Award: \$149,712

Aim: To develop a hip exoskeleton to assist mobility in patients with peripheral artery disease.

### National Science Foundation CAREER

submitted Jul 2018

“Locomotion Energetics of the Human Foot”

Primary Investigator: Takahashi KZ

Total Award: \$547,668

Aim: Determine the mechanism in which the human foot produces and utilize energy (mechanical, metabolic, and thermal) during locomotion.

Score: not competitive (1<sup>st</sup> submission)

### \*Department of Defense CDMRP OPORP

submitted Jan 2018

“The Effects of Using Running-Specific Prostheses with Different Alignment to Optimize Performance of Service Members with Transtibial Amputations”

Primary Investigators: Grabowski AM (CU Boulder); co-I Takahashi KZ

Total Award: \$1,999,851

Aim: Examine the effect of prosthetic alignment on running and sprinting performance in persons with limb amputations.

Score: 1.5 – Outstanding

(1.0 = highest merit, 5.0 = lowest merit)

*\*recommended for funding as an alternate*

### Department of Defense CDMRP OPORP

submitted Jan 2018

“Effect of PD-AFO Category on Biomechanics and Patient Reported Outcomes in Clinical Prescription”

Primary Investigators: Kingsbury T (Naval Medical Center San Diego); co-I Takahashi KZ

Total Award: \$500,000

Aim: Determine the effects of ankle-foot orthoses on biomechanics and clinical outcomes in military service members with lower extremity injuries

Score: 2.6 – Fair

(1.0 = highest merit, 5.0 = lowest merit)

### Department of Defense CDMRP OPORP

submitted Jan 2018

“Comparison of Active and Passive Orthotic Devices for Enhancing Gait Coordination in Traumatic Brain Injury Subjects”

Primary Investigators: Mukherjee M (UNO); co-I Takahashi KZ

Total Award: \$1,673,110

Aim: Compare effectiveness of active and passive orthotic devices in assisting mobility for individuals with traumatic brain injury

Score: 2.9 – Fair

(1.0 = highest merit, 5.0 = lowest merit)

## Kota Z. Takahashi – Curriculum Vitae

### **Department of Defense CDMRP PRORP**

submitted Sep 2017

“Optimizing the Alignment and Performance of Running-Specific Leg Prostheses”

Primary Investigators: Grabowski AM (CU Boulder); co-I Takahashi KZ

Total Award: \$1,999,863

Aim: Examine the effect of prosthetic alignment on running and sprinting performance in persons with limb amputations.

Score: 2.5 – Good

(1.0 = highest merit, 5.0 = lowest merit)

### **Nebraska EPSCoR First Award**

submitted Sep 2017

“Reverse-Engineering Human Foot and Ankle Design”

Primary Investigator: Takahashi KZ

Total Award: \$56,403

Aim: Determine the fundamental structure-function relationships of the human foot and ankle during functional movement tasks

### **\*Department of Defense CDMRP OPORP**

submitted Aug 2016

“Optimizing the Alignment and Performance of Running-Specific Leg Prostheses”

Primary Investigators: Grabowski AM (CU Boulder); co-I Takahashi KZ

Total Award: \$1,800,000

Aim: Examine the effect of prosthetic alignment on running and sprinting performance in persons with limb amputations.

Score: 2.1 – Good

(1.0 = highest merit, 5.0 = lowest merit)

*\*recommended for funding as an alternate*

### **Nebraska EPSCoR First Award**

submitted Sep 2016

“Reverse-Engineering Human Foot and Ankle Design”

Primary Investigator: Takahashi KZ

Total Award: \$50,000

Aim: Determine the fundamental structure-function relationships of the human foot and ankle during functional movement tasks

### **NIH/NINDS R01**

submitted Jun 2016

“Multisensory Contributions to Asymmetrical Gait after Stroke”

Primary Investigator: Mukherjee M (UNO); co-I Takahashi KZ

Total Award: \$1,429,775

Aim: Determine multisensory contributions to asymmetric gait in stroke survivors

Score: not discussed

### **K12 Interdisciplinary Rehabilitation Engineering Research Career Development**

submitted Aug 2016

“Foot Biomechanics and Thermoregulation in Diabetes and Peripheral Artery Disease”

Primary Investigator: Takahashi KZ

Total Award: \$250,000

Aim: Examine the link between foot biomechanics and thermodynamics in patients with diabetes and peripheral artery disease

### **BADER Consortium**

submitted Nov 2015

## **Kota Z. Takahashi – Curriculum Vitae**

“The Effects of Running-Specific Leg Prosthetic Alignment on Running and Sprinting Performance”

Primary Investigator: Grabowski AM (CU Boulder); co-I Takahashi KZ

Total Award: \$1,723,338

Aim: Examine the effects of prosthetic alignment on running and sprinting performance in persons with limb amputations

### **Department of Defense CDMRP**

submitted Nov 2015

“From Laboratory to Community: Using Gait Variability to Guide Prosthetic Development and Prescription”

Primary Investigator: Myers SA (UNO); co-I Takahashi KZ

Total Award: \$915,000

Aim: Examine the effects of prosthetic mechanics and gait variability on clinical outcomes in persons with limb amputations

Score: 2.5 – Good

(1.0 = highest merit, 5.0 = lowest merit)

### **Department of Defense CDMRP**

submitted Nov 2015

“The Effect of a Passive Exoskeletal Device on Locomotor Adaptive Ability in Chronic Stroke Survivors”

Primary Investigator: Mukherjee M (UNO); co-I Takahashi KZ

Total Award: \$500,000

Aim: Examine the effects of a passive leg exoskeleton on motor adaptation during walking in chronic stroke survivors

Score: 2.5 – Good

(1.0 = highest merit, 5.0 = lowest merit)

### **NBA/GE Health Care Orthopedics and Sports Medicine Collaboration Grant**

submitted Feb 2016

“Contributing Factors and Risk Assessment of Patellar Tendinopathy in Collegiate Basketball Players: A Multi-Site Collaboration”

Primary Investigator: Rosen A (UNO); co-I Takahashi KZ

Total Award: \$274,697

Aim: Examine morphological characteristics in basketball players that increase risks for patellar tendinopathy

### **New Balance Footwear Research Award**

submitted Feb 2016

“Towards Optimizing Shoe Stiffness with In-Vivo Muscle Analyses”

Primary Investigators: Takahashi KZ; Ray S (UNO)

Total Award: cost for 45 customized footwear

Aim: Examine the role of shoe bending stiffness on ankle muscle-tendon mechanics and whole-body metabolic cost during locomotion.

### **NASA EPSCOR**

submitted Dec 2015

“Locomotor Adaptation to Destabilizing Force Field Perturbations in Simulated Reduced Gravity Environments”

Primary Investigators: Takahashi KZ; Mukherjee M (UNO)

Total Award: \$750,000

### **National Institute of Health – Individual Postdoctoral Fellowship (F32)**

submitted Apr 2013, Dec 2013

“Functional Interaction between Ankle Joint and Foot Structures during Locomotion”

Role: Principal Investigator

Total Award: \$168,846.00

Score: 48 (1<sup>st</sup> submission), not discussed (2<sup>nd</sup> submission)

## Kota Z. Takahashi – Curriculum Vitae

### *Grant Support for my Trainees (funded):*

**4. University of Nebraska at Omaha UCRCA Grant** May 2019 – Aug 2019  
“A Novel Methodology for Comparison of Foot Temperature Changes with Energy Dissipation”  
Primary Investigator: Kern A (UNO)  
Total Award: \$5,000  
Aim: To develop a thermography-based analysis to quantify regional foot temperature changes during locomotion.

**\*3. National Institute of Health – Individual Postdoctoral Fellowship (F31)** Sep 2018 – Aug 2021  
“Structure and Function of Aging Achilles Tendon and Plantar Fascia In-Vivo”  
Principal Investigator: Jeffrey Patterson  
Total Award: \$107,098  
*\*The third student from UNO to receive this fellowship. The student terminated the grant after Year 1 due to a career change*

**\*2. Barry Goldwater Scholarship** April 2017  
“Validation of Postural Sway Measurements using the Wii Balance Board”  
Primary Investigator: Zachary Meade  
Total Award: \$7,500  
*\*The first student from UNO to receive this scholarship.*

**\*1. National Science Foundation – Graduate Research Fellowship** Jul 2017 – Jun 2020  
“Efficient Variability: Linking Fractal Gait Patterns with Metabolic Energy Savings”  
Primary Investigator: Chase Rock  
Total Award: \$138,000  
*\*The second student from UNO to receive this fellowship. The student is now a doctoral student at Georgia Institute of Technology*

### *Grants for my Trainees (submitted – not funded):*

**American Heart Association Fellowship** submitted Dec 2020  
“Mechanics and Thermodynamics of Human Foot and Ankle: Insights for Cardiovascular and Musculoskeletal Health”  
Primary Investigator: Papachatzis N (UNO)  
Total Award: \$31,520  
Aim: To understand the interplay between foot and ankle mechanics and thermodynamic responses.

**National Science Foundation – Graduate Research Fellowship** submitted Oct 2019  
“Effect of Blood Flow Occlusion on Work Done and Plantar Temperature during Walking”  
Primary Investigator: Jose Anguiano-Hernandez  
Total Award: \$138,000

**National Science Foundation – Graduate Research Fellowship** submitted Oct 2018  
“Towards Optimizing Biomimetic Ankle Devices During Various Mechanical Demands of Human Locomotion”  
Primary Investigator: Erica Hedrick  
Total Award: \$138,000

**National Science Foundation – Graduate Research Fellowship** submitted Oct 2017

## Kota Z. Takahashi – Curriculum Vitae

“Manipulating Foot Stiffness to Alter Walking Performance During Load Carriage”

Primary Investigator: Amber Robinson

Total Award: \$138,000

**\*National Science Foundation – Graduate Research Fellowship**

submitted Oct 2015, Oct 2016

“Augmenting Human Muscle Performance through Added Foot Stiffness”

Primary Investigator: Samuel Ray

Total Award: \$138,000

*\*received an Honorable Mention*

**National Science Foundation – Graduate Research Fellowship**

submitted Oct 2016, Oct 2017

“Increasing Muscle Force Production in Elderly Individuals to Improve Walking”

Primary Investigator: Angel Gonzalez

Total Award: \$138,000

**National Science Foundation – Graduate Research Fellowship**

submitted Oct 2015

“Efficient Variability: Linking Fractal Gait Patterns with Metabolic Energy Savings”

Primary Investigator: Chase Rock

Total Award: \$138,000

**National Institute of Health – Individual Postdoctoral Fellowship (F32)**

submitted Dec 2015

“Using Behavior Measures and Functional Neuroimaging to Study Gait Variability with Audio Cueing”

Principal Investigator: Katy Worster

Total Award: \$164,365.00 1<sup>st</sup> submission = not discussed

**National Institute of Health – Individual Postdoctoral Fellowship (F31)**

submitted Dec 2015

“In Vivo Biomechanics of Push-off Impairments in Peripheral Artery Disease during Walking”

Principal Investigator: Eric Pisciotta

Total Award: \$97,296.00 1<sup>st</sup> submission = not discussed

**L’Oreal USA for Women in Science Fellowship**

submitted Feb 2016

“Improving Walking in Parkinson’s Disease with Audie Cues by Unveiling Brain-Behavior Relationships”

Principal Investigator: Katy Worster

Total Award: postdoc salary

## Invited Presentations

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**38. Near-Peer Stories of ASB Early Career Faculty – Invited Presentation**

Jul 14, 2021

Virtual Seminar

“Fortuitous Meetings and Events that Shaped My Career in Biomechanics”

**37. Dynamic Walking – Invited Presentation**

May 20, 2021

Virtual Conference

“Energetics of Human Feet: From Musculoskeletal Mechanisms to Application of Simple Wearable Devices”

[link to streamed video](#) (my talk begins at ~1:35)

**36. School of Human Movement and Nutrition Sciences – Virtual Seminar**

Jun 11, 2020

University of Queensland (Brisbane, Australia)

## Kota Z. Takahashi – Curriculum Vitae

“Locomotion Energetics of the Human Foot and Ankle: From Muscle Mechanics, Thermal Regulation to Wearable Devices”

**35. Department of Biomechanics – Invited Seminar** Jan 24, 2020

University of Nebraska at Omaha (Omaha, NE)

“Locomotion Energetics of the Human Foot and Ankle: From Muscle Mechanics, Thermal Regulation to Wearable Devices”

**34. Department of Kinesiology - Invited Seminar** Dec 18, 2019

University of Massachusetts Amherst (Amherst, MA)

“Locomotion Energetics of the Human Foot and Ankle: From Muscle Mechanics, Thermal Regulation to Wearable Devices”

**33. Department of Surgery - Invited Seminar** Aug 7, 2019

University of Nebraska Medical Center (Omaha, NE)

“Foot and Ankle Biomechanics: From Thermoregulation to Prosthetic Technology”

**32. Department of Mechanical Engineering– Invited Seminar** Mar 4, 2019

Vanderbilt University (Nashville, TN)

“Biomechanical Design of the Human Foot and Ankle: Engine, Transmission and Radiator”

**31. International Research Forum on Biomechanics of Running Specific Prostheses – Keynote Lecture**

National Institute of Advanced Industrial Science and Technology (Tokyo, Japan)

Feb 21, 2019

“Prosthetics and Locomotion Energetics: from Gait Rehabilitation to Elite Sprinting”

**30. Department of Biomechanics – Invited Seminar** Mar 16, 2018

University of Nebraska at Omaha (Omaha, NE)

“Biomechanical Design of the Human Foot and Ankle: Engine, Transmission and Radiator”

**29. International Research Forum on Biomechanics of Running Specific Prostheses** Feb 22, 2018

National Institute of Advanced Industrial Science and Technology (Tokyo, Japan)

“Mechanical Power and Work Profiles during Sprinting in Transfemoral Amputees”

(Poster co-presenter with Namiki Y, Hashizume S, and Hobarra H)

**28. Department of Integrative Physiology – Invited Presentation** Oct 30 2017

University of Colorado Boulder (Boulder, CO)

“Reverse-Engineering Human Foot and Ankle Design”

**27. Central Regional IDeA Conference – Invited Presentation** Jun 8, 2017

Sioux Falls, South Dakota

“Foot Biomechanics and Thermoregulation: Implications for Tissue Complications in Diabetes and Peripheral Artery Disease”

**26. Advanced Biomechanics II (BMCH 9640) – Guest Lecture** Mar 27, 2017

University of Nebraska at Omaha (Omaha, NE)

“Biomechanics of Prostheses and Athletic Performance”

**25. Motor Learning II (BMCH 9500) – Guest Lecture** Mar 16, 2017

University of Nebraska at Omaha (Omaha, NE)

## Kota Z. Takahashi – Curriculum Vitae

“Human-Prosthesis Interaction: A Window into Motor Learning”

- 24. Rehabilitation Engineering (BSEN 492) – Guest Lecture** Mar 15, 2017  
University of Nebraska Lincoln (Lincoln, NE)  
“Wearable Devices and Rehabilitation Engineering”
- 23. International Research Forum on Biomechanics of Running Specific Prostheses** Feb 22, 2017  
National Institute of Advanced Industrial Science and Technology (Tokyo, Japan)  
“Locomotion on Springs: From Biological Limbs to Prosthetic Devices”  
(Poster co-presenter with Stanhope SJ and Grabowski AM)
- 22. UT Clinically Applied Rehabilitation Engineering (CARE) – Guest Seminar** Nov 18, 2016  
University of Texas at Austin (Austin, TX)  
“Reverse-Engineering Human Foot and Ankle Structures”
- 21. Center for the Intrepid – Guest Seminar** Nov 17, 2016  
Brooke Army Medical Center (San Antonio, TX)  
“Structure and Function of Biological Limbs and Assistive Devices”
- 20. Exercise Physiology (EXS 335) – Guest Lecture** Mar 14, 2016  
Creighton University (Omaha, NE)  
“Structure and Function of Human Foot and Ankle: Inspirations for Wearable Device Technology”
- 19. International Research Forum on Biomechanics of Running Specific Prostheses** Feb 2, 2016  
National Institute of Advanced Industrial Science and Technology (Tokyo, Japan)  
“Energy Storage and Return of Running Specific Prostheses”  
(Poster co-presenter with Sharp K, Taboga P, Wyatt M, and Grabowski AM)
- 18. Gait Analysis/Biomechanics Laboratory – Guest Seminar** Oct 29, 2015  
Naval Medical Center San Diego (San Diego, CA)  
“Reverse-Engineering Human Musculoskeletal Structures to Inform Prescription of Prosthetic Limbs”
- 17. Department of Surgery Doctoral Seminar** Oct 7, 2015  
University of Nebraska Medical Center (Omaha, NE)  
“Paradoxical Foot and Ankle Functions during Human Locomotion”
- 16. Department of Health and Exercise Science Seminar** Mar 20, 2015  
Appalachian State University (Boone, NC)  
“Driving a Car with Deflated Tires: A Mechanical Analogy for Foot and Ankle Function during Locomotion”
- 15. Technology Partnership of Nagoya University Inc., (NU Tech) Seminar** Mar 6, 2015  
(Raleigh, NC)  
“Robots Beyond Science Fiction: A New Reality Towards Technology-Assisted Rehabilitation”
- 14. School of Health, Physical Education and Recreation (HPER) Seminar** Jan 12, 2015  
University of Nebraska at Omaha (Omaha, NE)  
“Reverse-Engineering Human Musculoskeletal Design to Drive Rehabilitation of Ankle-Foot Pathologies”
- 13. School of Nutrition and Health Promotion Seminar** Jan 8, 2015

## Kota Z. Takahashi – Curriculum Vitae

Arizona State University (Phoenix, AZ)

“Reverse-Engineering Human Musculoskeletal Design to Drive Rehabilitation of Ankle-Foot Pathologies”

**12. Department of Kinesiology, Recreation, and Sport Studies (KRSS) Seminar** Dec 3, 2014

University of Tennessee (Knoxville, TN)

“Reverse-Engineering Human Musculoskeletal Design to Drive Rehabilitation of Ankle-Foot Pathologies”

**11. Dr. William M. Scholl College of Podiatric Medicine – Grand Round Lecture** Aug 28, 2014

Rosalind Franklin University (North Chicago, IL)

“Reverse-Engineering Human Musculoskeletal Design to Drive Rehabilitation of Ankle-Foot Pathologies”

**10. Gait & Clinical Movement Analysis Society 2014 Conference – Tutorial Lecture** Jun 24, 2014

(Newark, DE)

“From Body to Joints to Muscles: An Integrative Multi-Scale Assessment of Ankle and Foot Function in Human Locomotion”

(Co-Presenter with Robertson BD, Farris DJ, Piazza SJ, and Sawicki GS)

**9. Department of Kinesiology Seminar** Jun 13, 2014

East Carolina State University (Greenville, NC)

“Paradoxical Ankle and Foot Function during Human Locomotion: Questions for Biology, Opportunities for Engineering”

**8. Biomechanics & Movement Science (BIOMS) Interdisciplinary Program Seminar** Feb 14, 2013

University of Delaware (Newark, DE)

“Reverse-Engineering Human Musculoskeletal Design to Drive Rehabilitation of Ankle-Foot Pathologies”

**7. Nature Research Center – National Postdoc Appreciation Week Seminar Series** Sep 18, 2013

(Raleigh, NC)

“Building the Next RoboCop: Wearable Devices to Help People Move”

**6. Human Physiology of Wearable Robotics (PoWeR) Lab** Oct 17, 2012

North Carolina State University (Raleigh, NC)

“Mechanical Energy Profiles of Ankle-Foot Structures: Insights for Rehabilitation Devices”

**5. Graduate Student Forum** May 4, 2012

University of Delaware (Newark, DE)

“Academic e-Portfolios: Setting Yourself Apart in the Academic Job Market”

**4. Good Shepherd Rehabilitation Network – Guest Seminar** Apr 25, 2012

(Philadelphia, PA)

“Comparisons of Power & Energy in Anatomical and Prosthetic Below-Knee Structures during Gait”

**3. Independence Prosthetics - Orthotics, Inc** Mar 5, 2012

(Newark, DE)

“Comparisons of Power & Energy in Anatomical and Prosthetic Below-Knee Structures during Gait”

**2. Graduate Teaching Assistant Conference** Aug 23, 2011

University of Delaware (Newark, DE)

“Engaging Students in Their Learning: Why and How?”



**1. Graduate Teaching Assistant Conference**

Aug 22, 2011

University of Delaware (Newark, DE)

“Life as a Graduate Student and TA: Keeping All the Balls in the Air”

**Conference Presentations**

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*Podium:*

- \*30.** Papachatzis N, Slivka DR, Pipinos II, and **Takahashi KZ**. Is the dissipative energetic behavior of the human heel associated with thermal changes? *Human Movement Variability and Great Plains American Society of Biomechanics* (Virtual Meeting), May 2021.  
*\*winner of Promising Graduate Student Award*
- 29.** Gonzalez AG, Pineda-Gutierrez A, Kern AM, and **Takahashi KZ**. Foot thermal response to shear force magnitude during turning. *Human Movement Variability and Great Plains American Society of Biomechanics* (Virtual Meeting), September 2020.
- 28.** Krupenevich RL, Ray SF, Clark WH, **Takahashi KZ**, Kashefsky HE, and Franz JR. The effects of age and locomotor demand on foot muscles during walking. *American Society of Biomechanics* (Virtual Meeting), August 2020.
- 27.** Hedrick EA, Malcolm P, Wilken JM, and **Takahashi KZ**. The importance of ankle stiffness in minimizing metabolic cost during load carriage: A prosthetic emulator study. *International Society of Biomechanics*, August 2019, Calgary, AB, Canada.
- 26.** Maun J, Gard SA, Major MJ, and **Takahashi KZ**. The effect of shock-absorbing pylon stiffness on prosthetic mechanical work during walking. *International Society of Biomechanics*, August 2019, Calgary, AB, Canada.
- 25.** Papachatzis N, Ray SF, and **Takahashi KZ**. The effects of foot anthropometry on plantar flexor muscle fascicle mechanics and metabolic cost of walking. *International Society of Biomechanics*, August 2019, Calgary, AB, Canada.
- \*24.** Lanier A, Kim N, Friend M, Karabon A, **Takahashi KZ**, and Grandgenett NF. Assessment of biomechanics learning in elementary and undergraduate students using a questioning scenario. *International Society of Biomechanics*, August 2019, Calgary, AB, Canada.  
*\*this abstract was selected for the Teaching Symposium*
- 23.** Kern AM, Faber GJ, and **Takahashi KZ**. A system for quantifying regional foot temperature changes following locomotion. *Rocky Mountain American Society of Biomechanics*, April 2019, Estes Park, CO, USA.
- 22.** Maun J, Gard SA, Major MJ, and **Takahashi KZ**. The effect of shock-absorbing pylon stiffness on prosthetic mechanical work during walking. *Rocky Mountain American Society of Biomechanics*, April 2019, Estes Park, CO, USA.

## Kota Z. Takahashi – Curriculum Vitae

- 21.** Hedrick EA, Stanhope SJ and **Takahashi KZ**. Force, displacement, and work profiles of structures distal to the shank in normal gait: insights for bio-inspired foot and ankle devices. *Rocky Mountain American Society of Biomechanics*, April 2018, Estes Park, CO, USA.
- 20.** Papachatzis N, Malcolm P, Nelson C and **Takahashi KZ**. Modulation of foot mechanical work during walking with added mass. *Rocky Mountain American Society of Biomechanics*, April 2018, Estes Park, CO, USA.
- 19.** Patterson JM, Papachatzis N, Kern A, Slivka DR, Pipinos II and **Takahashi KZ**. The relationship between the foot's mechanical energy and heat. *Rocky Mountain American Society of Biomechanics*, April 2018, Estes Park, CO, USA.
- 18.** Gonzalez A, Wooden T, Lanier AS, Friend M, Karabon A, Grandgenett N and **Takahashi KZ**. Software-based training can improve student learning in undergraduate biomechanics class. *Rocky Mountain American Society of Biomechanics*, April 2018, Estes Park, CO, USA.
- 17.** Ray SF, Wurdeman SR, and **Takahashi KZ**. Mechanical energy analysis to quantify adaptation to a new prosthesis. *Military Health System Research Symposium*, August 2017, Kissimmee, FL, USA.
- 16.** Bruening DA, Pohl MB, **Takahashi KZ**, Barrios JA. Running strike pattern, midtarsal locking, and the windlass mechanism. *American Society of Biomechanics*, August 2017, Boulder, CO, USA.
- \*15.** Bruening DA, and **Takahashi KZ**. Partitioning ground reaction forces for multi-segment foot kinetics. *Gait and Clinical Movement Analysis Society*, May 2017, Salt Lake City, UT, USA.  
\*received Best Podium Award, and nominated for Best Paper Award for Gait & Posture
- 14.** Meade Z, Kent J, Stergiou N, and **Takahashi KZ**. The relationship between postural sway and sensation in the residual limb of transtibial amputees. *Rocky Mountain American Society of Biomechanics*, April 2017, Estes Park, CO, USA.
- 13.** Rock CG, Marmelat V, Yentes J, and **Takahashi KZ**. Relationship between step-to-step variability and metabolic cost of transport in human walking. *Rocky Mountain American Society of Biomechanics*, April 2017, Estes Park, CO, USA.
- 12.** Worster K, Bruening DA, and **Takahashi KZ**. Deconstructing ankle and foot power during human walking: a segment-by-segment approach. *American Society of Biomechanics*, August 2016, Raleigh, NC, USA.
- 11.** Papachatzis N, Rock CG, Stergiou N, and **Takahashi KZ**. Effects of unilateral push-off deficiency on stride-to-stride fluctuations during human walking. *American Society of Biomechanics*, August 2016, Raleigh, NC, USA.
- 10.** Vanderheyden T, and **Takahashi KZ**. Development of a treadmill with a dynamically adaptive surface. *Nebraska Academy of Sciences*, April 2016, Lincoln, NE, USA.
- 9.** Ray SF, Wurdeman SR, and **Takahashi KZ**. Transtibial prosthesis users exhibit increased positive work following adaptation. *Rocky Mountain American Society of Biomechanics*, April 2016, Estes Park, CO, USA.

## Kota Z. Takahashi – Curriculum Vitae

8. Kent JA, Papachatzis N, Vanderheyden T, Stergiou N, and **Takahashi KZ**. Delivery of vibration to the residual limb via the prosthetic socket: Preliminary investigation of signal integrity. *Rocky Mountain American Society of Biomechanics*, April 2016, Estes Park, CO, USA.

7. Zelik KE, **Takahashi KZ**, and Sawicki GS. Positively missing: reassessing work production in human gait and the implications for assistive technology. *World Congress of Biomechanics*, July 2014, Boston, MA, USA.

\*6. **Takahashi KZ**, and Sawicki GS. A user-controlled powered ankle exoskeleton to assist gait propulsion post-stroke. *American Society of Biomechanics*, September 2013, Omaha, NE.

*\*received nomination for Clinical Biomechanics Award (top 11 finalist)*

5. **Takahashi KZ**, Stanhope SJ, and Sawicki GS. Functional interaction between ankle joint and distal foot structures during locomotion. *Dynamic Walking*, June 2013, Pittsburgh, PA.

4. **Takahashi KZ**, and Stanhope SJ. Positive news for passive-dynamic prosthetics: the human ankle-foot system does net negative work during stance. *Gait & Clinical Movement Analysis Society*, May 2012, Grand Rapids, MI.

3. **Takahashi KZ**, Razzook AR, Guinn LD, Schrank ES, Kepple TM, and Stanhope SJ. A unified deformable segment model of the combined ankle-foot system that does work. *American Society of Biomechanics*, August 2011, Long Beach, CA.

\*2. **Takahashi KZ**, Razzook AR, Guinn LD, Schrank ES, and Stanhope SJ. A model of normal gait roll-over dynamics: one step closer to customizing prosthetic ankle-foot components. *Gait & Clinical Movement Analysis Society*, April 2011, Bethesda, MD.

*\*received award for Dr. Kevin Granata Young Investigator Award (best student podium presentation)*

1. **Takahashi KZ**, Razzook AR, Guinn LD, Schrank ES, and Stanhope SJ. A method for characterizing combined ankle-foot dynamics during stance phase of gait. *Center for Biomedical Engineering Research Symposium*, May 2010, University of Delaware.

### **Thematic Poster:**

4. Papachatzis N, Slivka DR, Pipinos II, **Takahashi KZ**. Can foot's mechanical energy during walking be dissipated as heat? *American Society of Biomechanics* (Virtual Meeting), August 2021.

3. Krupenevich RL, **Takahashi KZ**, Kashefsky HE, and Franz JR. Interaction between soleus and plantar intrinsic muscle length points to a structural transmission between the human foot and ankle. *American Society of Biomechanics* (Virtual Meeting), August 2021.

2. Hedrick EA, Stanhope SJ, and **Takahashi KZ**. Force, displacement, and work profiles of structures distal to the shank in normal gait: insights for bio-inspired foot and ankle devices. *American Society of Biomechanics*, August 2018, Rochester, MN.

1. **Takahashi KZ**, and Stanhope SJ. Net efficiency of the combined ankle-foot system in normal gait: insights for passive and active prosthetics. *American Society of Biomechanics*, August 2012, Gainesville, FL.

### **Poster:**

## Kota Z. Takahashi – Curriculum Vitae

48. Antonellis P, Mohammadzadeh Gonabadi A, **Takahashi KZ** and Malcolm P. Effects of forward forces at the center-of-mass on joint moments. *American Society of Biomechanics* (Virtual Meeting), August 2021.
47. Papachatzis N, Slivka DR, Pipinos II, and **Takahashi KZ**. Can foot' mechanical energy during walking be dissipated as heat? *American Society of Biomechanics* (Virtual Meeting), August 2021.
46. Antonellis P, Mohammadzadeh Gonabadi A, **Takahashi KZ** and Malcolm P. Effects of forward forces at the center-of-mass on joint moments. *American Society of Biomechanics* (Virtual Meeting), August 2021.
45. Papachatzis N, Slivka DR, Pipinos II, and **Takahashi KZ**. Is the dissipative energetic behavior of the human heel associated with thermal changes? *International Society of Biomechanics* (Virtual Meeting), July 2021.
44. Papachatzis N, Maun JA, Franz JR, and **Takahashi KZ**. Shoe-stiffness modification to improve gait in older adults: a feasibility study. *Human Movement Variability and Great Plains Biomechanics* (Virtual Meeting), September 2020.
43. Maun JA, Gard SA, Major MJ, and **Takahashi KZ**. The effect of changing stiffness in a shock-absorbing pylon on prosthesis mechanical work. *Human Movement Variability and Great Plains Biomechanics* (Virtual Meeting), September 2020.
42. Faber G, Anguiano-Hernandez J, and **Takahashi KZ**. A comparison of foot temperature responses after walking on overground versus treadmill. *Human Movement Variability and Great Plains Biomechanics* (Virtual Meeting), September 2020.
41. Anguiano-Hernandez J, and **Takahashi KZ**. The effect of blood flow occlusion on foot temperature during and after walking. *Human Movement Variability and Great Plains Biomechanics* (Virtual Meeting), September 2020.
40. Gonzalez AG, Pineda-Gutierrez A, Kern AM, and **Takahashi KZ**. Foot thermal response to shear force magnitude during turning. *American Society of Biomechanics* (Virtual Meeting), August 2020.
39. Kern AM, and **Takahashi KZ**. A system for quantifying foot temperature changes following locomotion. *International Society of Biomechanics*, August 2019, Calgary, AB, Canada.
38. Patterson JM, and **Takahashi KZ**. Mechanical work of the human foot during sloped walking. *International Society of Biomechanics*, August 2019, Calgary, AB, Canada.
37. Sloan I, Kent JA, Likens A, Sommerfeld J, **Takahashi KZ**, and Stergiou N. Effect of vibrotactile stimuli on unilateral transtibial amputees. *International Society of Biomechanics*, August 2019, Calgary, AB, Canada.
36. Hedrick EA, Malcolm PM, Wilken JM, and **Takahashi KZ**. Ankle stiffness effect on metabolic cost and joint work during load carriage: a prosthetic emulator study. *Rocky Mountain American Society of Biomechanics*, April 2019, Estes Park, CO, USA.
35. Papachatzis N, Ray SF, and **Takahashi KZ**. The effects of foot anthropometry on plantar flexor muscle fascicle mechanics and metabolic cost of walking. *Rocky Mountain American Society of Biomechanics*, April 2019, Estes Park, CO, USA.

## Kota Z. Takahashi – Curriculum Vitae

- \***34.** Ray SF, and **Takahashi KZ**. Reducing the metabolic cost of fast walking through stiff insoles. *American Society of Biomechanics*, August 2018, Rochester, MN.  
\*finalist for Master's Student Poster Competition
- 33.** Lanier AS, **Takahashi KZ**, Friend M, Karabon A, Moulton S, Grandgenett N. Biomechanics to engage elementary STEM education. *American Society of Biomechanics*, August 2018, Rochester, MN.
- 32.** Kern AM, Papachatzis N, Patterson JM, Bruening DA and **Takahashi KZ**. Walking with added mass influences ankle and mid-tarsal joint quasi-stiffness. *American Society of Biomechanics*, August 2018, Rochester, MN.
- 31.** Papachatzis N, Malcolm P, Nelson C and **Takahashi KZ**. Modulation of foot mechanical work during walking with added mass. *American Society of Biomechanics*, August 2018, Rochester, MN.
- 30.** Patterson JM, Papachatzis N, Kern A, Slivka DR, Pipinos II and **Takahashi KZ**. The relationship between the foot's mechanical energy and heat. *American Society of Biomechanics*, August 2018, Rochester, MN.
- 29.** Gonzalez A, Wooden T, Lanier AS, Friend M, Karabon A, Grandgenett N and **Takahashi KZ**. Software-based training can improve student learning in undergraduate biomechanics class. *American Society of Biomechanics*, August 2018, Rochester, MN.
- 28.** Kern AM, Papachatzis N, Patterson JM, Bruening DA and **Takahashi KZ**. Walking with added mass influences ankle and mid-tarsal joint quasi-stiffness. *Rocky Mountain American Society of Biomechanics*, April 2018, Estes Park, CO, USA.
- 27.** **Takahashi KZ**, Gonzalez A, Baudendistel S, Lanier A, Grandgenett NF. Software-based training to enhance student learning in biomechanics. *American Society of Biomechanics*, August 2017, Boulder, CO, USA.
- 26.** Patterson JM, Papachatzis, N, **Takahashi KZ**. Preliminary evidence that foot mechanical energy during walking is dissipated as heat. *American Society of Biomechanics*, August 2017, Boulder, CO, USA.
- 25.** Kent JA, **Takahashi KZ**, Marmelat V, Stergiou N. Velocity-based control of postural sway during quiet standing in people with a unilateral transtibial amputation. *American Society of Biomechanics*, August 2017, Boulder, CO, USA.
- 24.** Kent J, **Takahashi KZ**, Meade Z, Ouattas A, and Stergiou N. Sub-threshold vibration for the enhancement of sensation and function in transtibial amputees: preliminary results. *Gait and Clinical Movement Analysis Society*, May 2017, Salt Lake City, UT, USA.
- 23.** Patterson JM, Papachatzis N, and **Takahashi KZ**. Can foot mechanical energy be dissipated as heat? *Rocky Mountain American Society of Biomechanics*, April 2017, Estes Park, CO, USA.
- 22.** Kent JA, **Takahashi KZ**, Marmelat V, and Stergiou N. Postural sway during quiet standing in people with an amputation: investigating velocity-based control with a unilateral sensory deficit. *Rocky Mountain American Society of Biomechanics*, April 2017, Estes Park, CO, USA.
- 21.** Ray SF, Wurdeman SR, and **Takahashi KZ**. Pushoff work is increased following prosthesis adaptation. *American Society of Biomechanics*, August 2016, Raleigh, NC, USA.

## Kota Z. Takahashi – Curriculum Vitae

- 20.** Rock CG, Wurdeman SR, Stergiou N, and **Takahashi KZ**. Relationship between push-off work and stride-to-stride fluctuations in transtibial prosthesis users. *American Society of Biomechanics*, August 2016, Raleigh, NC, USA.
- 19.** **Takahashi KZ**, Gross MT, van Werkhoven H, Piazza SJ, and Sawicki GS. Engine and transmission: soleus muscle actuator function is modulated by foot mechanics. *Biomechanics and Neural Control of Movement*, June 2016, Mt. Sterling, OH, USA
- 18.** Worster K, Bruening DA, and **Takahashi KZ**. Partitioning ankle and foot power during human walking. *Rocky Mountain American Society of Biomechanics*, April 2016, Estes Park, CO, USA.
- \*17.** Vanderheyden T, Kent J, Papachatzis N, and **Takahashi KZ**. Design and validation of a complex terrain generating variable surface treadmill. *Rocky Mountain American Society of Biomechanics*, April 2016, Estes Park, CO, USA.  
*\*received award for best undergraduate poster presentation*
- 16.** Rock CG, Marmelat V, Yentes J, and **Takahashi KZ**. Metabolic cost of transport and the persistence of stride-to-stride fluctuations during human walking. *Rocky Mountain American Society of Biomechanics*, April 2016, Estes Park, CO, USA.
- 15.** Papachatzis N, Rock CG, Stergiou N, and **Takahashi KZ**. Push-off mechanics and stride-to-stride fluctuations during human walking. *Rocky Mountain American Society of Biomechanics*, April 2016, Estes Park, CO, USA.
- 14.** Mattes K, Kent JA, Stergiou N, and **Takahashi KZ**. Comparison of Wii balance board and laboratory grade force plate for the measurement of sway during standing. *Rocky Mountain American Society of Biomechanics*, April 2016, Estes Park, CO, USA.
- 13.** Maaiah S, Worster K, Vanderheyden T, **Takahashi KZ**. Designing a more versatile cap for monitoring brain activity. *Student Research and Creative Activity Fair*, March 2016, University of Nebraska at Omaha.
- 12.** Papachatzis N, Kent J, Vanderheyden T, Stergiou N, **Takahashi KZ**. Frequency validation of a high-bandwidth vibrotactile transducer for clinical use. *Student Research and Creative Activity Fair*, March 2016, University of Nebraska at Omaha.
- 11.** Ray S, Wurdeman S, **Takahashi KZ**. Quantifying energetic adaptation to prosthetic devices. *Student Research and Creative Activity Fair*, March 2016, University of Nebraska at Omaha.
- 10.** Rock C, Wurdeman S, Stergiou N, **Takahashi KZ**. Push-off work and stride-to-stride fluctuations in below knee prosthesis users. *Student Research and Creative Activity Fair*, March 2016, University of Nebraska at Omaha.
- \*9.** Vanderheyden T, **Takahashi KZ**. Locomotion on dynamically adaptive terrain. *Student Research and Creative Activity Fair*, March 2016, University of Nebraska at Omaha.  
*\*received honorable mention for best undergraduate poster presentation*
- 8.** Worster K, Bruening DA, **Takahashi KZ**. Expanding our knowledge of ankle and foot interactions in walking. *Student Research and Creative Activity Fair*, March 2016, University of Nebraska at Omaha.

## Kota Z. Takahashi – Curriculum Vitae

7. **Takahashi KZ**, Gross MT, van Werkhoven H, Piazza SJ, and Sawicki GS. The effects of added foot stiffness on soleus muscle fascicle behavior during human walking. *American Society of Biomechanics*, August 2015, Columbus, OH, USA
6. Bell EA, **Takahashi KZ**, Rider PM, Sawicki GS and Domire ZJ. Effect of plantar fascia stiffness on foot energy absorption during overground walking. *American Society of Biomechanics*, August 2015, Columbus, OH, USA.
5. **Takahashi KZ**, Lewek MD, Sawicki GS. A user-controlled powered ankle exoskeleton to drive gait modifications post-stroke. *World Congress on Biomechanics*, July 2014, Boston MA.
4. **Takahashi KZ**, Razzook AR, Guinn LD, Schrank ES, Kepple TM, and Stanhope SJ. A unified deformable (UD) segment model for measuring combined shank-foot power. *Center for Biomedical Engineering Research Symposium*, May 2011, University of Delaware.
3. **Takahashi KZ**, Razzook AR, Guinn LD, Schrank ES, and Stanhope SJ. Roll-over shape dynamics during stance in natural gait. *American Society of Biomechanics*, August 2010, Providence, RI.
2. **Takahashi K**, and Stanhope SJ. Sensitivity analysis of loading conditions on mechanical stiffness measurements of a passive dynamic ankle foot orthoses. *American Society of Biomechanics*, August 2009, State College, PA.
1. **Takahashi K**, and Stanhope SJ. A novel method for estimating stiffness of passive dynamic ankle foot orthoses. *Center for Biomedical Engineering Research Symposium*, May 2009, University of Delaware.

## Teaching Experience

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### *University of Nebraska at Omaha:*

Biomechanics (BMCH 4630) – 28 students	Spring 2021
Advanced Biomechanics (BMCH 8450/9451) – 15 students	Fall 2020
Biomechanics (BMCH 4630) – 37 students	Spring 2020
Advanced Biomechanics (BMCH 8450/9451) – 15 students	Fall 2019
Biomechanics (BMCH 4630) – 40 students	Fall 2018
Biomechanics (BMCH 4630) – 38 students	Fall 2017
Biomechanics (BMCH 4630) – 28 students	Fall 2016

### *University of Delaware:*

Biomechanics of Human Motion (HESC 425) – 36 students	Spring 2011
Teaching Assistant, Functional Anatomy (HESC 420) – 20 students	Fall 2010
Strength & Conditioning Laboratory (HESC 317) – 42 students	Spring 2008

### *Catholic University of America:*

Teaching Assistant, Biomechanics (BE 202) – 20 students`	Spring 2007
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## **Short-Term Professional Experience**

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- 4. Software Specialist, C-Motion Inc.** Aug 29-31, 2011  
Visual3D Software Workshop (Tokyo, Japan)  
Designed and instructed a three-day training seminar on Visual3D software for employees of a Japanese reseller of Visual3D (Inter-Reha Co., LTD), and a professor of biomechanics. Collected gait data of a single human subject, and taught basic principles of biomechanical modeling, computation, data analysis, and data reporting using Visual3D.
- 3. IT Specialist/Volunteer, Biomechanics Priorities Conference** Jun 9-11, 2010  
(Newark, DE, USA)  
Assisted in preparation and organization of the conference. Provided IT support during the conference.
- 2. Software Specialist/Interpreter, C-Motion Inc.** May 12-14, 2010  
Visual3D Software Workshop (Tokyo, Japan)  
Executed on-site English-Japanese translations during Visual3D software training. Provided one-on-one training for existing and potential Visual3D users. Visited a laboratory of an existing Visual3D user (Digital Human Research Center) to supply customer support and expertise.
- 1. Software Specialist/Interpreter, C-Motion Inc.** Apr 23-24, 2009  
Visual3D Software Workshop (Kingston, ON, Canada)  
Executed on-site English-Japanese translations during Visual3D software training for employees of a Japanese reseller of Visual3D (NAC Imaging Technology Inc.). Provided on-one-on software training.

## **Academic Service**

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### ***Professional Societies:***

#### **American Society of Biomechanics (ASB):**

- ASB annual conference abstract reviewer: 2015 – present
- Co-chair of thematic poster session on ‘Ankle/Foot Stiffness’, ASB Virtual 2021 (w/ Hanwen Zhang)
- Student mentoring program: 2016 - present
- Panelist on ‘Academic Careers’, ASB Virtual 2020 (w/ Carolyn Eng)
- Co-chair of podium session on ‘Prosthetics Orthotics’, ASB Virtual 2020 (w/ Elisa Arch)
- Participant for National Biomechanics Day local outreach events: 2016 - 2019
- Co-organizer of Rocky Mountain ASB 2018, Estes Park CO (w/ Boyi Dai and Abbie Ferris)
- Journal of Biomechanics Awards Committee, ASB 2017 Boulder CO
- Co-chair of thematic poster session on ‘Energetics’, ASB 2017 Boulder CO (w/ Gregory Sawicki)
- Co-chair of podium session on ‘Gait’, Rocky Mountain ASB 2017 (w/ Wouter Hoogkamer)
- Co-chair of podium session on ‘Modeling and Simulation’, ASB 2016 Raleigh NC (w/ Zachary Domire)
- Co-chair of podium session on ‘Level Gait’, ASB 2015 Columbus OH (w/ Brian Umberger)

#### **Gait and Clinical Movement Analysis Society (GCMAS):**

- GCMAS annual conference abstract reviewer: 2016
- Organizer of tutorial on ‘Foot and Ankle Biomechanics’, GCMAS 2014 Newark DE  
(w/ Benjamin Robertson, Dominic Farris, Stephen Piazza, Gregory Sawicki)
- Panelist on ‘Student Careers’, GCMAS 2012 Grand Rapids MI



## Kota Z. Takahashi – Curriculum Vitae

### *Institutional/Departmental:*

University of Nebraska at Omaha/Department of Biomechanics:

Chair of Graduate Program Committee, Fall 2021- present  
Member of College-level Graduate Program Committee, Fall 2021-present  
Member of Doctoral Program Committee, Fall 2018-Spring 2021  
Member of Graduate Program Committee, Fall 2018-Spring 2021  
Member of STEM Leadership Committee, Fall 2017-present  
Faculty advisor for Pre-Physical Therapy Club, Fall 2017-present  
Member of Associate Faculty Search Committee, Fall 2019 – Spring 2020 (hired David Kingston)  
Member of Academic Standards and Policies Committee, Fall 2017 – Spring 2019  
Chair of Full/Associate Faculty Search Committee, Fall 2017 – Fall 2018 (hired Alexey Kamenskiy)  
Member of Graduate Program Committee, Fall 2016 – Spring 2018  
Member of Machining and Prototyping Committee, Fall 2015 – Fall 2018

Center for Research in Human Movement Variability

Co-chair of podium session on ‘Great Plains Biomechanics’ 2021 (w/ Keith Gordon)  
Member of Program Organizing Committee for the Human Movement Variability and Great Plains Biomechanics Conference 2021  
Co-chair of podium session on ‘Biomechanics’, Annual Conference 2020 (w/ Carolin Curtze)  
Chair of Search Committee for a Lab Technician, Spring 2020 (hired Corey Frederick)  
Associate Director, Movement Analysis Core, Fall 2019 – Spring 2020  
Co-chair of podium session on ‘Biomechanics’, Annual Conference 2019 (w/ Carolin Curtze)

North Carolina State University

Panelist on ‘Academic Careers’, Biomedical Engineering Research Retreat 2014  
Panelist on ‘Mentoring from the Postdoc’s Perspective’, Postdoctoral Association 2014  
Secretary, Office of Postdoctoral Association, Fall 2013 – Spring 2014

University of Delaware

Panelist on ‘Should I go to Graduate School?’, Undergraduate Research Retreat 2011  
Panelist on ‘Work-life balance’, Teaching Assistant Workshop 2011  
Member, Student Committee for Center of Biomedical Engineering Research Symposium 2010

### **Community Outreach**

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Career Day at Manchester Elementary (Elkhorn, NE) – demonstrated ultrasound and thermal imaging to 5<sup>th</sup> grade students, May 2019  
STEM University event (Omaha, NE) – demonstrated electromyography, robotics and vertical jumping test for K-6th students, April 2018  
Nebraska Robotics Expo (Ashland, NE) – demonstrated prosthetic legs and robotics hands to K-12 students, February 2018  
Perry Initiative (Omaha, NE) – volunteered for an event to engage local female students interested in careers in orthopedics and biomedical engineering  
Lights on Afterschool (Omaha, NE) – demonstrated an apparatus for measuring balance and coordination to First-8<sup>th</sup> grade students in afterschool activities

## Kota Z. Takahashi – Curriculum Vitae

- STEM University event (Omaha, NE) – demonstrated ultrasound imaging and Wii-balance board to K-6<sup>th</sup> students, April 2017
- Boy Scout Jubilee (Omaha, NE) – demonstrated ultrasound imaging and Wii-balance board for boy scouts, October 2016
- Caregiver Appreciation Open House (Omaha, NE) – demonstrated Wii-balance board and prosthetic legs to local caregivers, November 2015
- Lights on Afterschool (Omaha, NE) - demonstrated an apparatus for measuring balance and coordination to First-8<sup>th</sup> grade students in afterschool activities, October 2015
- Host for Human PoWeR Lab visit (Raleigh, NC) – designed a 2 hour workshop for 15 children who are home-schooled, using 3D motion capture, electromyography, ultrasound, and exoskeleton, October 2014
- Open Minds Teen Sciences Cafes (Raleigh, NC) – presented a talk on ‘Wearable Robotics’ and demonstrated a brain-controlled robotic exoskeleton to young teens
- ‘Live at Nine’ Guest Speaker WBFT TV (Sanford, NC) – appeared for a local television show and demonstrated a myoelectrically controlled robotic exoskeleton and discussed rehabilitation applications.
- University of North Carolina Science Expo (Chapel Hill, NC) – demonstrated a robotic exoskeleton to a general audience of K-12<sup>th</sup> students and their parents
- BEST (Biotechnology, Engineering, Science and Technology) Fest (Raleigh, NC) – demonstrated a myoelectrically controlled robotic ankle exoskeleton to a general audience of students and their parents
- Parents and Family Weekend at University of Delaware (Newark, DE) – presented an overview of research at the Biomechanics Laboratory and motion capture technology

## Ad hoc Journal Reviewer

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Journal of Biomechanics	2012-present
Journal of Theoretical Biology	2013-present
IEEE Transactions on Neural Systems & Rehabilitation Engineering	2014-present
Prosthetics & Orthotics International	2014-present
Scientific Reports	2014-present
Journal of Applied Biomechanics	2015-present
Applied Bionics and Biomechanics	2015-present
Journal of NeuroEngineering and Rehabilitation	2015-present
Human Movement Science	2016-present
Medical & Biological Engineering & Computing	2016-present
Gait & Posture	2016-present
Journal of Experimental Biology	2017-present
PeerJ	2018-present
Journal of the Royal Society Interface	2018-present
PLOS One	2018-present
Journal of Applied Physiology	2018-present
Journal of Medical Devices	2018-present
Archives of Physical Medicine and Rehabilitation	2018-present
ASME Journal of Medical Devices	2019-present
Disability and Rehabilitation	2019-present
Biomedical Engineering Applications Basis and Communications	2020-present
IEEE Transactions on Biomedical Engineering	2020-present
Sports Medicine	2020-present
Physical Therapy	2021-present

## Grant Reviewer

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DOD CDMRP Peer-Reviewed Medical Research Program, pre-application 2019  
Orthotic and Prosthetic Education and Research Foundation (OPERF) 2019, 2020  
DOD CDMRP Spinal Cord Injury Research Program, peer review panel 2018  
Postdoctoral Researchers International Mobility Experience (PRIME) 2018  
VA SPIRE grant proposal reviewer 2016, 2020

## Mentoring

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### *Postdoc:*

**Andrew Kern** – Biomechanics, UNO Fall 2017 – Summer 2019  
Currently a research engineer at Medtronics

**Kate Worster** - Biomechanics, UNO Fall 2015 – Summer 2016  
currently a biomedical engineer at UHealth Foot and Ankle Center (Denver, CO)

### *Doctoral Students:*

**Nikolaos Papachatzis** – Biomechanics, UNO Fall 2017 – present  
winner of Promising Graduate Student Award at the Human Movement Variability Conference 2021,  
winner of Best Graduate Oral Presentation at UNO Research Fair (2x, at 2019 and 2020 conference),  
recipient of GRACA research grant from UNO, attendee of NIH Summer Course in Clinical and  
Translational Research

**Jeffrey Patterson** – Biomechanics, UNO Fall 2016 – Spring 2018  
recipient of NIH F31 fellowship; did not finish his degree due to change in career path; currently a Data  
Manager in Clinical Trials Office at University of Rochester Medical Center.

### *Masters Students:*

**Logan White** – Biomechanics, UNO starting in Fall 2021

**Jenny Anne Maun** – Biomechanics, UNO Fall 2018 – Spring 2021  
recipient of UNO Women’s Club Fellowship, Paul Beck Scholarship

**Angel Gonzalez** – Biomechanics, UNO Fall 2017 – Summer 2020  
recipient of NASA Nebraska Space Grant Fellowship, ASB Student Travel Award; currently a gait lab  
engineer at Mary Free Bed Rehabilitation Hospital

**Erica Hedrick** – Biomechanics, UNO Fall 2017 – Spring 2019  
recipient of UNO College of Education Outstanding Graduate Student Award, finalist for UNO Elton S.  
Carter Award for Excellence in Master’s thesis, GRACA research grant from UNO, NASA Nebraska  
Space Grant Fellowship; currently a doctoral student at UNO with Dr. Brian Knarr

**Samuel Ray** - Biomechanics, UNO Fall 2015 – Summer 2019  
recipient of GRACA research grant from UNO, honorable mention from NSF Graduate Fellowship,  
Force and Motion Student Travel Scholarship, NASA Nebraska Space Grant Fellowship, finalist for  
ASB Master’s Student Poster Competition

**Nikolaos Papachatzis** – Biomechanics, UNO Fall 2015 – Fall 2017  
Currently a doctoral student at UNO

**Chase Rock** - Biomechanics, UNO Fall 2015 – Summer 2017

## Kota Z. Takahashi – Curriculum Vitae

recipient of NSF Graduate Fellowship, GRACA research grant from UNO, Delsys Student Travel Grant, NASA Nebraska Space Grant Fellowship; currently a doctoral student at Georgia Institute of Technology with Dr. Young-Hui Chang

### *Laboratory Engineer/Staff:*

**Travis Vanderheyden** – Mechanical Engineering, UNO Fall 2015 – Summer 2016  
recipient of best undergraduate poster presentation at Rocky Mountain ASB conference

### *Undergraduate Students:*

**Ana Pineda-Gutierrez** – Biology, UNO Spring 2019 – Spring 2021

Currently a research assistant at the University of Nebraska Medical Center with Dr. Diane Ehlers

**Jose Anguiano-Hernandez** – Physics, UNO Spring 2019 – Summer 2020

recipient of FUSE undergraduate research grant; currently a MS student with Dr. David Kingston at UNO

**Greg Faber** – Exercise Science, UNO Spring 2017 – Summer 2020

**Aaron Robinson** – Biomechanics, UNO Spring 2017 – Spring 2018

**TeSean Wooden** – Biomechanics, UNO Spring 2017 – Spring 2018

Currently a MS student with Dr. Song-Young Park at UNO

**Amber Robinson** – Mathematics, UNO Spring 2017 – Spring 2018

**Zachary Meade** – Electrical Engineering, UNO Summer 2016 – Summer 2018

recipient of Barry Goldwater Scholarship, FUSE undergraduate research grant, finalist for Harry

Truman Scholarship, winner of Outstanding Undergraduate Oral Presentation at UNO Research Fair

**Angel Gonzalez** – Exercise Science, UNO Spring 2016 – Summer 2017

**John Kotsalis** – Computer Engineering, University of Nebraska Lincoln Summer 2016 – Fall 2016

**Natalie Wheeler** – Physical Therapy, University of Nebraska Medical Center Summer 2016

**Samuel Maaiah** - Biotechnology, UNO Fall 2015 – Spring 2016

recipient of FUSE undergraduate research grant

**Taylor Cook** - Biomedical Engineering, North Carolina State University Spring 2015

**Neelam Modi** - Biomedical Engineering, North Carolina State University Spring 2015

**Arianna Nasser** - Biomedical Engineering, North Carolina State University Summer 2014 – Spring 2015

**Leighanne Davis** - Biomedical Engineering, North Carolina State University Fall 2013 – Spring 2014

**Samuel Ray** - Biomedical Engineering, North Carolina State University Summer 2013-Spring 2014

**Brittany Wilder** - Mechanical Engineering, University of Delaware Summer & Fall 2008

**Alissa Kregling** - Exercise Science, University of Delaware Summer 2009

### *Intern:*

**Yumna Ali** – intern from University of Rome Fall 2018

Currently a doctoral student at University of Verona

### *High School Student:*

**Rohan Chandrasekhar** - Enloe High School, Raleigh, NC Summer 2013

### **Graduate Student Committees (not Chair)**

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## Kota Z. Takahashi – Curriculum Vitae

### *Doctoral Students:*

<b>Takashi Sado</b> – Biomechanics, UNO (Chair: Mukul Mukherjee)	Spring 2020 - present
<b>Diego Saldonid</b> – Neuroscience, University of Nebraska Medical Center (Chair: Max Kurz)	Fall 2019 - present
<b>Arash Mohammadzadeh Gonabadi</b> – Biomechanics, UNO (Chair Philippe Malcolm)	Fall 2018 - present
<b>Prokopios Antonellis</b> – Biomechanics, UNO (Chair: Philippe Malcolm)	Fall 2017 – Summer 2020
<b>Eric Honert</b> – Mechanical Engineering, Vanderbilt (Chair: Karl Zelik)	Summer 2018 – Spring 2019
<b>Owen Beck</b> – Integrative Physiology, CU Boulder (Chair: Alena Grabowski)	Fall 2016 – Fall 2017
<b>Jenny Kent</b> - Biomechanics, UNO (Chair: Nicholas Stergiou)	Fall 2015 – Summer 2018

### *Masters Students:*

<b>Larry Robbins</b> – Exercise Science, UNO (Chair: Dustin Slivka)	Fall 2021- present
<b>Monica Kwon</b> – Exercise Science, UNO (Chair: Dustin Slivka)	Spring 2021- present
<b>Siena Senatore</b> – Biomechanics, UNO (Chair: Philippe Malcolm)	Spring 2021 – present
<b>Ben Meister</b> – Exercise Science, UNO (Chair: Dustin Slivka)	Fall 2019 – Spring 2020
<b>Christos Ziliaskoudis</b> – Exercise Science, UNO (Chair: Matthew Heesch)	Fall 2018 – Spring 2019
<b>Jacqueline Gutierrez</b> – Exercise Science, UNO (Chair: Adam Rosen)	Fall 2018 – Spring 2019
<b>Megan Vande Hei</b> – Exercise Science, UNO (Chair: Dustin Slivka)	Fall 2018 – Spring 2019
<b>Cory Frederick</b> – Biomechanics, UNO (Chair: Philippe Malcolm)	Fall 2017 – Spring 2018
<b>Hoon Kim</b> – Exercise Science, UNO (Chair: Adam Rosen)	Fall 2016 – Summer 2017
<b>Stephen Allen</b> – Integrative Physiology, CU Boulder (Chair: Alena Grabowski)	Fall 2017 – Spring 2018

## Senior Design Supervision

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**Variable Stiffness Attachable Shoe Sole** Fall 2020 – Spring 2021

Biological Systems Engineering (University of Nebraska - Lincoln)

Supervised a group of students (Becca Francis, Angel Olivera-Torres, Abby Haworth, Sierra Mendez, and Peter McLeay) on a project to develop a shoe sole with a variable stiffness.

**A Mobile Solution for Preventing Foot Ulcers** Fall 2017 – Spring 2018

Electrical and Computer Engineering (UNO)

Supervised a group of students (Zachary Meade, Mason Schleu, Kurt Pavlik and Jacob Curtis) on a project to develop a portable temperature-measuring insole integrated with bluetooth technology.

**Smart Shoe Insert** Fall 2018 – Spring 2019

Biological Systems Engineering (University of Nebraska - Lincoln)

Supervised a group of students (Janelle Adam, Alexandra Favazza, Aliya Kunikeeva, and Sam Lindbald) on a project to develop a variable stiffness shoe insert.

**Skin Temperature Detecting System for Prosthesis Users** Fall 2018 – Spring 2019

Biological Systems Engineering (University of Nebraska - Lincoln)

Supervised a group of students (Logan Piening, Alex Hruby, Madison Spence, and Phuong Ninh) on a project to develop a temperature-sensing prosthetic socket for individuals with limb amputation.

## Professional Affiliations

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American Society of Biomechanics

2009-present

## Kota Z. Takahashi – Curriculum Vitae

Gait and Clinical Movement Analysis Society	2012-2015
International Society of Biomechanics	2007
National Council on Strength and Fitness	2006-2008
Bridging Advanced Developments for Exceptional Rehabilitation (BADER) Consortium	2013-present

### **Professional Certifications**

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First Aid/CPR, <i>American College of Emergency Physicians</i>	2008-2009, 2010-present
Personal Training, <i>National Council on Strength and Fitness</i>	2006-2008

### **Software/Hardware Experience**

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Visual3D  
Matlab  
Labview  
Oxycon Mobile  
Bertec Instrumented Treadmill  
AMTI Force Platforms  
Telemed Ultrasound  
Vicon Nexus  
EvaRT/Cortex  
Microsoft Office (PowerPoint, Word, Excel)

### **Language Skills**

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Fluency in English and Japanese

## References

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**Gregory S. Sawicki, Ph.D.**

(Postdoctoral Advisor)

Associate Professor

School of Mechanical Engineering

Georgia Institute of Technology

Email: gregory.sawicki@me.gatech.edu

Office: 404-385-5706

**Steven J. Stanhope, Ph.D.**

(Doctoral Advisor)

Associate Vice President for Research

Professor

Department of Kinesiology and Applied Physiology

University of Delaware

Email: stanhope@udel.edu

Office: 302-831-3496

**Jason R. Franz, Ph.D.**

(Collaborator)

Associate Professor

Joint Department of Biomedical Engineering

University of North Carolina at Chapel Hill and North Carolina State University

Email: jrfranz@email.unc.edu

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**Jason M. Wilken, PT, Ph.D.**

(Collaborator)

Associate Professor

Department of Physical Therapy and Rehabilitation Science

University of Iowa

Email: Jason-wilken@uiowa.edu

Office: 319-335-6857

**W. Lee Childers, CP, Ph.D.**

(Collaborator)

Senior Scientist

Extremity Trauma and Amputation Center of Excellence (EACE)

Military Performance Lab, Center for the Intrepid

Brooke Army Medical Center

Email: walter.l.childers.civ@mail.mil

Office: 210-916-8679