

**Philippe Malcolm**

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**H-index: 19, 1270 citations**

<https://scholar.google.be/citations?user=Q1XcsrUAAA&hl=en&oi=sra>

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## Positions

2017-present Assistant Professor at Department of Biomechanics and Center for Research in Human Movement Variability at the University of Nebraska at Omaha, Biomechanics Research Building

Associated with Harvard University  
John A. Paulson School of Engineering and Applied Sciences  
and Wyss Institute for Biologically Inspired Engineering

Postdoctoral collaborator with Movement Science Lab at Ghent University  
Department of Movement and Sports Sciences

2015-2016 Postdoctoral Research Fellow, Harvard University  
John A. Paulson School of Engineering and Applied Sciences  
and Wyss Institute for Biologically Inspired Engineering  
Role: Biomechanics team-lead in a project on design and development of a soft lower-extremity assistive device  
Advisor: Conor J. Walsh

Summer 2013 Visiting Scholar, Carnegie Mellon University  
Department of Mechanical Engineering  
Project: The influence of push-off timing in a robotic ankle-foot prosthesis on the energetics and mechanics of walking  
Advisor: Steven H. Collins

2010-2014 Postdoctoral Assistant, Ghent University  
Department of Movement and Sports Sciences  
Laboratory of Movement Science  
Advisor: Dirk De Clercq

## Education

2004-2010 Ph.D., Ghent University  
Thesis: Influence of intrinsic and extrinsic determinants on the transition from walking to running.  
Advisor: Dirk De Clercq, Committee: Andre Seyfarth, Marc Van Leemputte, Jos Vanrenterghem, Kristiaan D'Aout, Eric Witvrouw, Wim Derave

2002-2003 Second M.Sc., Academic Teaching Training, Ghent University

2000-2002 M.Sc. in Physical Education (Kinesiology), Ghent University,  
Grade: magna cum laude

1998-2000 B.Sc. in Physical Education (Kinesiology), Ghent University,  
Grade: cum laude

## Teaching

- 2017-2019    MATLAB for Movement Sciences
- 2017-2019    Undergraduate biomechanics
- 2017-2019    Guest lectures for Motor Control I
- 2013-2014    Honors program in movement science, 1<sup>st</sup> and 2<sup>nd</sup> year of kinesiology M.Sc.: advanced internship to prepare students for a job as sports scientist or the start of a Ph.D.
- 2012-2013    Lecturer in individual movement activities 1<sup>st</sup> and 2<sup>nd</sup> year of kinesiology M.Sc.: coordination of sports and sports didactics courses from 5 teaching assistants on track and field, artistic gymnastics, and swimming.
- 2008-2011    Movement analysis of fitness training, 1<sup>st</sup> year of kinesiology M.Sc.: EMG and isokinetic measurement practicum
- 2004-2014    Sport-specific movement analysis, 1<sup>st</sup> year of kinesiology M.Sc.: demonstration of all measurement methods in sports biomechanics and hands-on projects of each student his sports-coaching specialization
- 2004-2014    Movement analysis, 3<sup>rd</sup> year of kinesiology B.Sc.: practical exercises on gait analysis and lifting ergonomics with treadmill, force plate, video and motion capture
- 2004-2014    Biomechanics, 2<sup>nd</sup> year of kinesiology B.Sc.: practical exercises on ground reaction force measurement and data analysis in Excel

## **Mentoring and Advising**

Present	MSc. advisor of Kayla Kowalczyk and Siena Senatore
Present	PhD. advisor of Alex Dzewaltowski
2018-present	PhD. advisor of Arash M. Gonabadi
2017-2020	PhD. advisor of Prokopios Antonellis (graduated summer 2020)
2017-2018	MSc. advisor of Cory Frederick (graduated summer 2018)
2015	Co-mentor of one design-engineering final project at Harvard University
2010-2015	Co-advisor Ph.D. Breine B.: Initial foot contact patterns in shod running, relationship with speed and impact intensity
2010-2015	Mentor Ph.D.: Galle S.: Ankle-foot exoskeletons, from experimental optimization to practical applications
2011-2015	Advisor of eight M.Sc. theses in kinesiology and one M.Sc. thesis in electromechanical engineering
2013-2015	Mentor of two honors theses
2004-2010	Mentor of seven M.Sc. theses in kinesiology

## **Student grant support**

2019	AMTI ASB travel grant	Prokopios Antonellis	\$1000
2019	UNO GRACA	Prokopios Antonellis and Arash M. Gonabadi	\$5000
2019	UNO FUSE	Taylor Runyan	\$2000
2019	NIH Summer workshop	Prokopios Antonellis	
2018	UNO GRACA	Prokopios Antonellis	\$5000
2018	OpenSim virtual workshop entry	Arash M. Gonabadi	

## Publications

### Manuscripts as first author (\* is equal contribution)

1. **Malcolm, P.**, Galle, S., Van Den Berghe, P., De Clercq, D., 2018. Exoskeleton assistance symmetry matters: Unilateral assistance reduces metabolic cost, but relatively less than bilateral assistance. *J. Neuroeng. Rehabil.* 15. <https://doi.org/10.1186/s12984-018-0381-z>
2. **Malcolm, P.**, Galle, S., Derave, W., de Clercq, D., 2018. Bi-articular knee-ankle-foot exoskeleton produces higher metabolic cost reduction than a weight-matched mono-articular exoskeleton. *Front. Neurosci.* 12.
3. **Malcolm, P.**, Rossi, D. M., Siviyy, C., Lee, S., Quinlivan, B. T., Grimmer, M., and Walsh, C. J. “Continuous Sweep versus Discrete Step Protocols for Studying Effects of Wearable Robot Assistance Magnitude” *Journal of NeuroEngineering and Rehabilitation* 14, no. 1 (2017): 72. doi:10.1186/s12984-017-0278-2
4. **Malcolm, P.**, Lee, S., Crea, S., Siviyy, C., Saucedo, F., Galiana, I., Panizzolo, F. A., Holt, K. G., and Walsh, C. J. “Varying Negative Work Assistance at the Ankle with a Soft Exosuit during Loaded Walking” *Journal of NeuroEngineering and Rehabilitation* 14, no. 1 (2017): 62. doi:10.1186/s12984-017-0267-5
5. **Malcolm, P.**, Galle, S., and Clercq, D. De. “Fast Exoskeleton Optimization” *Science* 356, no. 6344 (2017): 1230–1231. doi:10.1126/science.aan5367
6. Galle, S., **Malcolm, P.\***, Collins, S. H., and Clercq, D. De. “Reducing the Metabolic Cost of Walking with an Ankle Exoskeleton: Interaction between Actuation Timing and Power” *Journal of NeuroEngineering and Rehabilitation* 14, no. 1 (2017): 35. doi:10.1186/s12984-017-0235-0
7. **Malcolm, P.**, Quesada, R. E., Caputo, J. M., and Collins, S. H. “The Influence of Push-off Timing in a Robotic Ankle-Foot Prosthesis on the Energetics and Mechanics of Walking” *Journal of NeuroEngineering and Rehabilitation* 12, no. 1 (2015): 21. doi:10.1186/s12984-015-0014-8
8. **Malcolm, P.**, Breine, B., Frederick, E., Cheung, J., and Clercq, D. De. “Correlations between Strike Index and 5,000 and 10,000 M Performance in Male Runners” *Footwear Science* 5, no. S1 (2013): doi:10.1080/19424280.2013.799581
9. **Malcolm, P.**, Derave, W., Galle, S., and Clercq, D. De. “A Simple Exoskeleton That Assists Plantarflexion Can Reduce the Metabolic Cost of Human Walking” *PLoS One* 8, no. 2 (2013): e56137. doi:10.1371/journal.pone.0056137, **+275 citations.**
10. **Malcolm, P.**, Segers, V., Caekenberghe, I. Van, and Clercq, D. De. “Experimental Study of the Influence of the M. Tibialis Anterior on the Walk-to-Run Transition by Means of a Powered Ankle-Foot Exoskeleton.” *Gait & Posture* 29, no. 1 (2009): 6–10. doi:10.1016/j.gaitpost.2008.05.016
11. **Malcolm, P.**, Fiers, P., Segers, V., Caekenberghe, I. Van, Lenoir, M., and Clercq, D. De. “Experimental Study on the Role of the Ankle Push off in the Walk-to-Run Transition by Means of a Powered Ankle-Foot-Exoskeleton” *Gait & Posture* 30, no. 3 (2009): 322–327. doi:10.1016/j.gaitpost.2009.06.002
12. \*De Smet, K., **Malcolm, P.**, Lenoir, M., Segers, V., De Clercq, D., “Effects of Optic Flow on Spontaneous Overground Walk-to-Run Transition” *Experimental brain research* 193, no. 4 (2009): 501–8. doi:10.1007/s00221-008-1648-6

## Manuscripts as co-author

1. Papachatzis N, **Malcolm P**, Nelson CA, Takahashi KZ. Walking with added mass magnifies salient features of human foot energetics. *Journal of Experimental Biology*. 2020 15;223(12).
2. Gonabadi AM, Antonellis P, **Malcolm P**. A system for simple robotic walking assistance with linear impulses at the center of mass. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. 2020.
3. Antonellis P, Frederick CM, Gonabadi AM, **Malcolm P**. Modular footwear that partially offsets downhill or uphill grades minimizes the metabolic cost of human walking. *Royal Society open science*. 2020 Feb 5;7(2):191527.
4. Hedrick, E.A., **Malcolm, P.**, Wilken, J.M. and Takahashi, K.Z., 2019. How Prosthetic Ankle Stiffness & Load Carriage Affect Metabolic Energy Expenditure During Walking. *JNER*, 2019
5. Jinsoo Kim, Giuk Lee, Roman Heimgartner, Dheepak Arumukhom Revi, Nikos Karavas, Danielle Louise Ryan Nathanson, Ignacio Galiana, Asa Eckert-Erdheim, Patrick Murphy, David Perry, Nicolas Menard, **Malcolm P**, Conor J. Walsh; Reducing the metabolic rate of walking and running with a versatile, portable soft exosuit. **Science**, 2019.  
**+ 30 citations**
6. B Breine, **P Malcolm**, S Galle, P Fiers, EC Frederick, D De Clercq, Running speed-induced changes in foot contact pattern influence impact loading rate, *European journal of sport science* 19 (6), 774-783 2019
7. M Grimmer, BT Quinlivan, S Lee, **P Malcolm**, DM Rossi, C Sivi, CJ Walsh, Comparison of the human-exosuit interaction using ankle moment and ankle positive power inspired walking assistance, *Journal of biomechanics* 83, 76-84 2 2019
8. P Antonellis, S Galle, D De Clercq, **P Malcolm**, Altering gait variability with an ankle exoskeleton *PloS one* 13 (10), e0205088 2018.
9. Kim, M., Ding, Y., **Malcolm, P.**, Speeckaert, J., Sivi, C. J., Walsh, C. J., and Kuindersma, S. "Human-in-the-Loop Bayesian Optimization of Wearable Device Parameters" *PLoS ONE* 12, no. 9 (2017): doi:10.1371/journal.pone.0184054
10. Breine, B., **Malcolm, P.**, Gerlo, J., Frederick, E. C., and Clercq, D. De. "Spatial Distribution of Impact Intensity under the Shoe in Different Foot Strike Patterns" *Footwear Science* 9, (2017): S24–S25. doi:10.1080/19424280.2017.1313901
11. Clercq, D. De, Breine, B., **Malcolm, P.**, Caekenberghe, I. Van, Fiers, P., and Frederick, E. C. "Striking the Ground with a Neutral Ankle Angle Results in Higher Impacts in Distance Running" *Footwear Science* 9, (2017): S31–S32. doi:10.1080/19424280.2017.1313905
12. Lee, G., Kim, J., Panizzolo, F. A., Zhou, Y. M., Baker, L. M., Galiana, I., **Malcolm, P.**, and Walsh, C. J. "Reducing the Metabolic Cost of Running with a Tethered Soft Exosuit" *Sci. Robot* 2, no. 6 (2017): 6708–31. doi:10.1126/scirobotics.aan6708
13. Quinlivan, B. T., Lee, S., **Malcolm, P.**, Rossi, D. M., Grimmer, M., Sivi, C., Karavas, N., Wagner, D., Asbeck, A., Galiana, I., and Walsh, C. J. "Assistance Magnitude versus Metabolic Cost Reductions for a Tethered Multiarticular Soft Exosuit" *Science Robotics* 2, no. 2 (2017): eaah4416. doi:10.1126/scirobotics.aah4416 **+ 150 citations**
14. Breine, B., **Malcolm, P.**, Segers, V., Gerlo, J., Derie, R., Pataky, T., Frederick, E. C., and Clercq, D. De. "Magnitude and Spatial Distribution of Impact Intensity Under the Foot Relates to Initial Foot Contact Pattern" *J Appl Biomech* (2017): 1–21. doi:10.1123/jab.2016-0206
15. Galle, S., Derave, W., Bossuyt, F., Calders, P., **Malcolm, P.**, and Clercq, D. De. "Exoskeleton Plantarflexion Assistance for Elderly" *Gait and Posture* 52, no. November (2017): 183–188. doi:10.1016/j.gaitpost.2016.11.040

16. Breine, B., **Malcolm, P.**, Caekenberghe, I. Van, Caekenberghe, I. Van, Fiers, P., Frederick, E. C., Clercq, D. De, Frederick, E. C., and Clercq, D. De. "Initial Foot Contact and Related Kinematics Affect Impact Loading Rate in Running" *Journal of Sports Sciences* 35, no. 15 (2017): 1556–1564. doi:10.1080/02640414.2016.1225970
17. Ding, Y., Panizzolo, F. A., Sivi, C. J., **Malcolm, P.**, Galiana, I., Holt, K. G., and Walsh, C. J. "Effect of Timing of Hip Extension Assistance during Loaded Walking with a Soft Exosuit" *Journal of NeuroEngineering and Rehabilitation* 13, no. 1 (2016): 87. doi:10.1186/s12984-016-0196-8
18. Lee, S., Crea, S., Galiana, I., Malcolm, P., Walsh, C. J., Galiana, I., Asbeck, A., Walsh, C. J., **Malcolm, P.**, Walsh, C. J., Galiana, I., Asbeck, A., and Walsh, C. J. "Controlling Negative and Positive Power at the Ankle with a Soft Exosuit" *Proceedings - IEEE International Conference on Robotics and Automation* 2016–June, (2016): 3509–3515. doi:10.1109/ICRA.2016.7487531
19. Breine, B., **Malcolm, P.**, Caekenberghe, I. Van, Fiers, P., and Clercq, D. De. "Kinematic Differences between (A)typical Initial Rearfoot and Midfoot Contact Patterns" *Footwear Science* 7, no. S1 (2015): S102-103.
20. Galle, S., **Malcolm, P.**, Derave, W., and Clercq, D. De. "Uphill Walking with a Simple Exoskeleton: Plantarflexion Assistance Leads to Proximal Adaptations" *Gait and Posture* 41, no. 1 (2015): 246–251. doi:10.1016/j.gaitpost.2014.10.015
21. Galle, S., **Malcolm, P.**, Derave, W., and Clercq, D. De. "Enhancing Performance during Inclined Loaded Walking with a Powered Ankle-foot Exoskeleton" *European Journal of Applied Physiology* 114, no. 11 (2014): 2341–51. doi:10.1007/s00421-014-2955-1
22. Breine, B., **Malcolm, P.**, Frederick, E. C., and Clercq, D. De. "Relationship between Running Speed and Initial Foot Contact Patterns" *Medicine and Science in Sports and Exercise* 46, no. 8 (2014): 1595–603. doi:10.1249/MSS.0000000000000267
23. Caekenberghe, I. Van, **Malcolm, P.**, Segers, V., and Clercq, D. De. "A Gradual Shift in Initial Foot-to-Ground Contact Patterns Depending upon Acceleration" *Footwear Science* 5, no. S1 (2013): S88-89.
24. Galle, S., **Malcolm, P.**, Derave, W., and Clercq, D. De. "Adaptation to Walking with an Exoskeleton That Assists Ankle Extension" *Gait & Posture* 38, no. 3 (2013): 495–499. doi:10.1016/j.gaitpost.2013.01.029

#### Other publications

1. Arash, M. G., & **Malcolm, P.** Tutorial: Using EduExo to visualize electromechanical delay in m. biceps brachii. American Society of Biomechanics educational repository, 2018.
2. **Malcolm, P.** & De Clercq, D., 2013. Best practice in biomechanics and how it can be used in high performance sport: The longitudinal follow-up during competition of an elite high-jump athlete. In *Managing High Performance Sport*. ISBN-10: 041567199X.
3. **Malcolm, P.**, 2010. Influence of intrinsic and extrinsic determinants on the transition from walking to running. *Ph.D. thesis*, Ghent University. Faculty of Medicine and Health Sciences.
4. De Clercq, D. & **Malcolm, P.**, 2009. Elite sports movement analysis: added value for training programs. *Flemish trainer school*.

Accepted / Under review / In preparation

1. Gonabadi, A. M., Antonellis, P., & **Malcolm, P.** Differences in metabolic rate time profile during walking using joint-space and musculoskeletal estimation methods. **In press** at PLOS Computational Biology.
2. Awad, LN, Conor JW, Malcolm P, Soft wearable robotics. Springer book on Wearable Robotics for Motion Assistance and Rehabilitation. **In press.**
3. Antonellis, P., Gonabadi, A. M., & **Malcolm, P.** Pushing the boundaries of efficient walking assistance, using timed forces at the center of mass. In review.

**Awards**

- 2018 Finalist selection for Clinical Translational Research Superstar grant writing competition.
- October 2013 Study of the week, literature update on mailing list sponsored by the International Society of Biomechanics  
Study: Adaptation to walking with an exoskeleton that assists ankle extension.
- April 2013 Study of the week, literature update on mailing list sponsored by the International Society of Biomechanics  
Study: A simple exoskeleton that assists plantarflexion can reduce the metabolic cost of human walking.
- 2007 Young Investigator Award, International Society of Biomechanics, XXIth Congress, Taipei  
Study: A pneumatic ankle-foot-orthosis as a mean to experimentally validate hypotheses about the role of the tibialis anterior in the walk-to-run transition.

## Hardware Demonstrations

- 2015 Warrior Web demo: Harvard Soft Exosuit. *DARPA Wait What? A Future Technology Forum*, St. Louis.
- 2014 WALL-X: A semi-Wearable Assistive Lower Leg eXoskeleton for testing effects of ankle assistance. *Dynamic Walking conference*, ETH Zürich.

## Invited Presentations

- 2020 Wearable Robotic Conference “A robotic tether can assist more efficiently than a passive tether, but the optimal timing is counterintuitive.”
- 2019 Using wearable robots to “feel” metabolic cost and provide simple timed assistance. UNMC Surgery Forum. Omaha
- 2019 Using wearable robots to “feel” metabolic cost and provide simple timed assistance. UNO Biomechanics Seminar Series, Omaha.
- 2019 Assistive mechanisms of (distal) ankle exoskeletons and a (proximal) robotic waist tether. ASB symposium on exoskeletons and prostheses.
- 2017 Exoskeleton actuation inspired by and informing biomechanics, BRB Seminar series, Omaha
- 2017 Optimization of exoskeleton actuation: Comparison of results with exoskeletons and exosuits, AHFE, Los Angeles
- 2014 Optimization of a simple Assistive Exoskeleton through human biomechanics experiments, Biodesign lab meeting, Harvard University, Cambridge
- 2014 Optimization of actuation and configuration of assistive devices for walking through human experiments, 7<sup>th</sup> World Congress of Biomechanics, Boston
- 2013 Effect of actuation and configuration of assistive devices, Lab visit, University of Michigan, Ann Arbor.
- 2013 Bipedal locomotion seminar, Carnegie Mellon University, Pittsburgh
- 2013 A simple exoskeleton can reduce the metabolic cost of walking. Dynamic Walking Conference, Carnegie Mellon University, Pittsburgh  
Video: [www.youtube.com/watch?v=qXIfHBH4ry0#t=8656](http://www.youtube.com/watch?v=qXIfHBH4ry0#t=8656)
- 2013 A simple pneumatically powered exoskeleton can reduce the metabolic cost of walking, High Tech Systems, Eindhoven

## Grants

### Awarded

- 2019 NIH COBRE GM109090 Exoskeleton optimization for reducing gait variability in patients with peripheral artery disease.  
Role: subproject lead PI: Nick Stergiou
- 2018 Nebraska/NSF EPSCOR Dynamic Indirect Calorimetry.  
Role: PI \$50,000
- 2018 University of Nebraska System Collaboration Initiative Exoskeletons for mobility assistance.  
Role: PI \$8,500
- 2017 Industry consultancy grant: J Brasch Co. LLC  
Gait-o-gram: differentiating fallers from non-fallers using nonlinear analysis.  
Role: PI \$64,480
- 2017 Influence of foot-ground traction on gaits for reduced gravity, NASA Nebraska, \$24,092.

### Submitted / Declined

- 2019 NSF CAREER: Dynamic Indirect Calorimetry: Using wearable robotics to estimate the time profile of metabolic cost and make biomechanics tangible. Submitted.
- 2019 University of Nebraska Collaboration Initiative seed grant: Clinically feasible hip exoskeleton design patients with PAD. Declined.
- 2019 NIH R15 Clinically feasible exoskeleton optimization for patients with PAD. Declined.
- 2018 NSF CAREER: Dynamic Indirect Calorimetry: Using wearable robotics to estimate the time profile of metabolic cost and make biomechanics tangible. Declined: ranked "medium competitive." (1x very good, 2x good, 1x fair)
- 2018 NIH R15 Hip exoskeleton facilitated therapy for improving mobility in patients with PAD. Declined: impact score 42
- 2018 University of Nebraska Collaboration Initiative seed grant: Hip exoskeleton facilitated therapy for improving mobility in patients with PAD. Declined.

## Academic Outreach

2020	Nebraska Robotics expo
2019	National biomechanics day and Nebraska Robotics expo
2018	National biomechanics day and Nebraska Robotics expo
2017	Reddit AMA on Exoskeletons
2015	Family Day of Discovery, Harvard University: Soft Exosuit demonstration
2014	Kids university day, Ghent University: Lecture about biomechanical support of an elite high jump athlete
2009	Science night, Ghent University: Biomechanical support of an elite high jump athlete
2004-2014	Ghent University: Yearly open-lab days for high-school students

## Media

2019	Media outreach for Report in Science covered by 102 news outlets with quotes in Scientific American, New Scientist, Boston Globe and The Telegraph. Attention score in top 1% of articles of same age <a href="https://www.altmetric.com/details/65022916">https://www.altmetric.com/details/65022916</a>
2017	Expert panel member on Reddit AMA session on exoskeletons
2017	Media outreach for Perspective article in Science <a href="https://www.altmetric.com/details/21274616">https://www.altmetric.com/details/21274616</a>
2017	Corresponding author for Science Robotics article on reducing the metabolic cost of running with a tethered exosuit including radio interview on NPR: Science Friday. Attention score in top 5% of all research scored on Altmetric <a href="https://robotics.altmetric.com/details/20735415">https://robotics.altmetric.com/details/20735415</a>
2017	Co-author on Science Robotics article on effects of assistance magnitude of a multi-articular exosuit. Attention score in top 5% of all research scored on Altmetric <a href="https://robotics.altmetric.com/details/15572794">https://robotics.altmetric.com/details/15572794</a>
2015	Citations of research in BBC website, The Economist and Popular Mechanics
2015, 2013	Two articles in Eos Magazine (Dutch and Belgian popular science magazine)

## **Memberships**

Present      International Society of Biomechanics  
                 American Society of Biomechanics  
                 American Association for the Advancement of Science  
                 Wearable Robotics Association  
                 Institute of Electrical and Electronics Engineers (IEEE)

## **Professional service**

2021            Co-organizer Rocky Mountain American Society of Biomechanics  
  
2019            Session co-chair at American Society of Biomechanics  
  
2018, 2019    Session chair at Rocky Mountain American Society of Biomechanics

## **Referee services**

Performed 62 manuscript reviews for  
IEEE Transactions on Neural Systems and Rehabilitation Engineering, Scientific Reports,  
Journal of the Royal Society Interface, Gait & Posture, Journal of Applied Physiology, European  
Journal of Applied Physiology, Journal of NeuroEngineering and Rehabilitation, Biocybernetics  
and Biomedical Engineering, IEEE RAS/EMBS International Conference on Biomedical  
Robotics and Biomechatronics, Robotica, IEEE Robotics and Automation Letters, Plos One,  
IEEE International Conference on Robotics and Automation, IEEE Transactions on Biomedical  
Engineering, IEEE International Conference on Intelligent Robots and Systems, IEEE  
International Conference on Rehabilitation Robotics, Royal Society Open Science, Science  
Robotics  
Review service record available on <https://publons.com/researcher/1217881/philippe-malcolm>