

Rajiv Ranganathan, PhD

Curriculum Vitae

Associate Professor
Department of Kinesiology
Department of Mechanical Engineering
Michigan State University
[Google Scholar Profile for Ranganathan](#)
[Motor Learning and Rehabilitation Engineering Lab](#)

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EDUCATION

Ph.D.	Kinesiology	The Pennsylvania State University	2009
M.S.	Kinesiology	University of Illinois at Urbana-Champaign	2005
B.E.	Electronics & Communication Engineering	Sri Venkateswara College of Engineering University of Madras, India	2003

EMPLOYMENT

Associate Professor, Departments of Kinesiology and Mechanical Engineering, Michigan State University. 2020 –

Assistant Professor, Departments of Kinesiology and Mechanical Engineering, Michigan State University. 2014 – 2020

Research Assistant Professor, Department of Physical Medicine and Rehabilitation, Northwestern University, 2012-2014

Research Associate, Rehabilitation Institute of Chicago, 2009-2012

RESEARCH EXPERTISE

Understanding motor learning and movement coordination, with an emphasis on applying this knowledge to improve neurorehabilitation and the design of assistive devices.

SELECTED PUBLICATIONS

† indicates students/postdoctoral scholars supervised by me

1. **Ranganathan, R.**, Lee, M. H., & Newell, K. M. (2020). Repetition without repetition: Challenges in understanding behavioral flexibility in motor skill. *Frontiers in psychology, 11*, 2018.
2. †Lokesh, R., & **Ranganathan, R.** (2020). Haptic assistance that restricts the use of redundant solutions is detrimental to motor learning. *IEEE Transactions on Neural Systems and Rehabilitation Engineering, 28*(6), 1373–1380.
3. Lee, M. H., & **Ranganathan, R.** (2019). Age-related deficits in motor learning are associated with altered motor exploration strategies. *Neuroscience, 412*, 40-47.
4. **Ranganathan, R.**, Lee, M. H., Padmanabhan, M. R., Aspelund, S., Kagerer, F. A., & Mukherjee, R. (2019). Age-dependent differences in learning to control a robot arm using a body-machine interface. *Scientific Reports, 9*(1),1960.
5. **Ranganathan, R.**, Gebara, R., Andary, M., & Sylvain, J. (2019). Chronic stroke survivors show task-dependent modulation of motor variability during bimanual coordination. *Journal of Neurophysiology, 121*, 756-763.
6. †Lin, T. H., †Denomme, A., & **Ranganathan, R.** (2018). Learning alternative movement coordination patterns using reinforcement feedback. *Experimental Brain Research, 236*,1395-1407.
7. Lee, M. H., Farshchiansadegh, A., & **Ranganathan, R.** (2018). Children show limited movement repertoire when learning a novel motor skill. *Developmental Science, 21*(4): e12614.
8. †Cardis, M., Casadio, M., & **Ranganathan, R.** (2018). High variability impairs motor learning regardless of whether it affects task performance. *Journal of Neurophysiology, 119*, 39-48.
9. **Ranganathan, R.** (2017). Reorganization of finger coordination patterns through motor exploration in individuals after stroke. *Journal of Neuroengineering and Rehabilitation, 14*, 90.
10. **Ranganathan, R.**, Wieser, J., Mosier, K. M., Mussa-Ivaldi, F. A., & Scheidt, R. A. (2014). Learning redundant motor tasks with and without overlapping dimensions: Facilitation and interference effects. *Journal of Neuroscience, 34*, 8289-8299.
11. **Ranganathan, R.**, Adewuyi, A. & Mussa-Ivaldi, F. A. (2013). Learning to be lazy: Exploiting redundancy in a novel task to minimize movement-related effort. *Journal of Neuroscience, 33*, 2754-2760.
12. **Ranganathan, R.**, & Newell, K. M. (2013). Changing up the routine: Intervention-induced variability in motor learning. *Exercise and Sport Sciences Reviews, 41*, 64-70.
13. Casadio, M., **Ranganathan, R.**, & Mussa-Ivaldi, F. A (2012). The body-machine interface: A new perspective on an old theme. *Journal of Motor Behavior, 44*, 419-433.

GRANTS

FUNDED

1. National Science Foundation. Reshaping motor learning in high-dimensional tasks via soft robotic physical interactions (NSF 1940950). Apr 2020. **Role: Co-PI** (PI: Vaibhav Srivastava, Other Co-PI: Xiaobo Tan)
2. National Science Foundation. Optimizing motor coordination through principles of motor relearning (NSF 1823889). Aug 2018. **Role: PI** (Co-PIs: Maura Casadio, Leigh Ann Mrotek).
3. National Science Foundation. A High Degree-of-Freedom Body-Machine Interface for Children with Severe Motor Impairments (NSF 1703735). Jul 2017. **Role: Co-PI** (PI: Ranjan Mukherjee; Other Co-PIs: Florian Kagerer, Mei-Hua Lee).
4. National Institutes of Health. *Altering activation patterns in the distal upper extremity after stroke*. (NICHD R01HD075813). Sep 2015. **Role: PI (Sub-award)** (PI: Elliot Roth).
5. Trifecta Pilot Funding Grant. *Evaluation of a motivational text messaging intervention to reduce hopelessness through physical activity in patients with coronary heart disease*. Oct 2015. **Role: Co-I** (PI: Susan Dunn).
6. Office of Vice-President for Research and Graduate Studies, Michigan State University. *Body-machine interface for children with severe motor impairments*. Dec 2014. **Role: Co-PI** (PI: Ranjan Mukherjee, Other Co-PIs: Florian Kagerer, Mei-Hua Lee).
7. MSU-Sparrow Center for Innovation and Research. *Assessment and rehabilitation of arm function in stroke using a virtual reality system*. Jan 2015–Dec 2016. **Role: PI**.
8. National Institutes of Health. *Functional reorganization of finger movements to improve hand dexterity* (NICHD R03HD069806). Jul 2012-Aug 2014. **Role: PI**.

TEACHING

Courses Taught:

1. Biomechanics of Physical Activity. (KIN 330). Michigan State University.
2. Biomechanical Analysis of Human Movement (ME 491). Michigan State University.
3. Principles of Human Movement (KIN 251). Michigan State University.
4. Motor Learning and Rehabilitation (KIN 960). Michigan State University.

ADVISING

GRADUATE STUDENTS

Current students

1. Simon Cone, PhD student, Department of Kinesiology. Fall 2020 –
2. Brian Fox, PhD student, Department of Kinesiology, Fall 2020 –

Former students

3. Tzu-Hsiang Lin, PhD, Department of Kinesiology. Fall 2015 – Spring 2020
4. Rakshith Lokesh, PhD, Department of Mechanical Engineering (Dual Major: Kinesiology). Spring 2016 – Spring 2020
5. Aimee Tomlinson, MS, Department of Kinesiology. Fall 2017 – Dec 2019

POSTDOCTORAL SCHOLARS

1. Shanie Jayasinghe. Research Associate. July 2017 – Feb 2019

EXTERNAL SERVICE

REVIEWING: JOURNALS

Ad-hoc reviewer for over 25 journals in motor learning and control including eLife, Experimental Brain Research, IEEE Transactions on Neural Systems & Rehabilitation Engineering, Journal of Experimental Psychology: Human Perception and Performance, Journal of Motor Behavior, Journal of Neurophysiology, Neurorehabilitation & Neural Repair, Neuroscience, PLoS Computational Biology, PLoS ONE and Scientific Reports

REVIEWING: GRANTS

Ad-hoc reviewer for the National Science Foundation and National Institutes of Health

PROFESSIONAL MEMBERSHIP

Neural control of Movement

Society for Neuroscience (SfN)

North American Society for the Psychology of Sport and Physical Activity (NASPSPA)

COMMUNITY OUTREACH

Actively involved in disseminating research to the public, especially focusing on programs promoting the importance of STEM education.

Interviewed on ‘Perception and Action’ podcast hosted by Dr. Rob Gray from Arizona State University. The audience for this podcast is a mix of both academics and practitioners (coaches, therapists) in motor learning. (<http://perceptionaction.com/103-2/>). Apr 2018.

Presenter, High School Engineering Institute (HSEI). College of Engineering, Michigan State University, Jul 2017.

Presenter, MSU Science Festival. Multi-day event celebrating science with life-long learners of all ages. Lab tour with hands-on demonstration. Apr 2015-2018.

Presenter, MSU Grandparents University. Educational program for grandparents and grandchildren (ages 8-12), Jun 2016-2018.