

Madhur Mangalam, Ph.D.

madhur.mangalam@uga.edu | 706.804.1678 | 125 Baldwin St, Athens, GA 30602

WORK EXPERIENCE

NORTHEASTERN UNIVERSITY | POSTDOCTORAL FELLOW

MOVEMENT NEUROSCIENCE LABORATORY, DEPARTMENT OF PHYSICAL THERAPY, MOVEMENT, AND REHABILITATION SCIENCE

January 2019 – Present | Boston, MA

w/ Prof. Eugene Tunik

EDUCATION

UNIVERSITY OF GEORGIA | PH.D.

BEHAVIOR AND BRAIN SCIENCES PROGRAM, DEPARTMENT OF PSYCHOLOGY

August 2014 – December 2018 | Athens, GA

Dissertation: The biomechanics of multi-joint posture and movement control in wild bearded capuchin monkeys using stone hammers.

w/ Prof. Dorothy M. Fragaszy, Prof. Karl M. Newell, & Prof. Dean Sabatinelli

UNIVERSITY OF MYSORE | RESEARCH ASSISTANT

DEPARTMENT OF PSYCHOLOGY

July 2012 – July 2014 | Mysore, KA, India

w/ Prof. Mewa Singh

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH PUNE | DUAL DEGREE B.S.–M.S.

LIFE SCIENCES

August 2007 – May 2012 | Pune, MH, India

Thesis: Strategies in novel food extraction tasks and responses to perceived threats in urban free-ranging dogs, *Canis familiaris*.
w/ Prof. Mewa Singh

RESEARCH INTERESTS

Biomechanics | Human Factors & Tool Use | Motor Control | Perception & Action | Sensorimotor Embodiment

PEER-REVIEWED PUBLICATIONS*

*Names of undergraduate mentees are underlined.

Mangalam, M., Conners, J. D., & Singh, T. (2018). Muscular effort differentially mediates perception of heaviness and length via dynamic touch. *Experimental Brain Research* (In press).

Mangalam, M., Rein, R., & Fragaszy, D. M. (2018). Bearded capuchin monkeys use joint synergies to stabilize the hammer trajectory while cracking nuts in bipedal stance. *Proceedings of the Royal Society of London B: Biological Sciences* (In press).

Mangalam, M., Pacheco, M. M., Fragaszy, D. M., & Newell, K. M. (2018). Perceptual learning of tooling affordances of a jointed object via dynamic touch. *Ecological Psychology* 30(4), xxx–xxx.

Mangalam, M. (2018). Emergent coordination with a brain-machine interface: Implications for the neural basis of motor learning. *Journal of Neurophysiology* 120(3), 889–892.

Mangalam, M., Conners, J. D., Fragaszy, D. M., & Newell, K. M. (2018). Location of a grasped object's effector influences perception of the length of that object via dynamic touch. *Experimental Brain Research* 236(7), 2107–2121.

Mangalam, M. & Fragaszy, D. M. (2018). Reply to “Tool use and dexterity: Beyond the embodied theory.” *Animal Behaviour* 139, e5–e8.

Fragaszy D. M. & **Mangalam, M.** (2018). Tooling. *Advances in the Study of Behavior* 50, 177–241.

Mangalam, M., Wagman, J. B., & Newell, K. M. (2018). Temperature influences perception of the length of a grasped object via effortful touch. *Experimental Brain Research* 236(2), 505–516.

Mangalam, M., Pacheco, M. M., Izar, P., Visalberghi, E., & Fragaszy, D. M. (2018). Unique perceptuomotor control of stone hammers in wild monkeys. *Biology Letters* 20170587.

Mangalam, M., Barton, S. A., Wagman, J. B., Fragaszy, D. M., & Newell, K. M. (2017). Length of an object perceived through dynamic touch remains invariant across changes in the medium. *Attention, Perception, & Psychophysics* 79(8), 2499–2509.

Mangalam, M., Newell, K. M., Visalberghi, E., & Fragaszy, D. M. (2017). Stone-tool use in wild monkeys: Implications for the study of the body-plus-tool system. *Ecological Psychology* 29(4), 300–316.

Mangalam, M. (2016). What makes a tool. In Shackelford, T. K. & Weekes-Shackelford, V. A. (Eds.), *Encyclopaedia of Evolutionary Psychological Science* (pp. 1–5). New York, NY: Springer.

Mangalam, M. & Fragaszy, D. M. (2016). Transforming the body-only system into the body-plus-tool system. *Animal Behaviour* 117, 115–22.

Mangalam, M., Desai, N., & Singh, M. (2016). Division of labor in hand usage: A democratic approach to explaining manual asymmetries in non-human primates. *Current Science* 110(9), 1630–1638.

Mangalam, M., Izar, P., Visalberghi, E., & Fragaszy, D. M. (2016). Task-specific temporal organization of percussive movements in wild bearded capuchin monkeys. *Animal Behaviour* 114, 129–137.

Classen, D., Kiessling, S. E., **Mangalam, M.**, Kaumanns, W., & Singh, M. (2016). Fission-fusion species under restricted housing conditions: A comparative study of inter-individual interactions and physical proximity in captive bonobos and Bornean orangutans. *Current Science* 110, 139–150. *Cover Page Article

Mangalam, M., Desai, N., & Singh, M. (2016). Self-organization of laterally asymmetric movements as a consequence of space-time optimization. *Journal of Theoretical Biology* 390, 50–60.

Zaunmair, P., **Mangalam, M.**, Kaumanns, W., Singh, M., & Slotta-Bachmayr, L. (2015). Patterns of dominance relationships among the females of a captive female-only group of lion-tailed macaques (*Macaca silenus*) during the course of the introduction of a new adult male. *Current Science* 109(4), 803–807.

Mangalam, M. & Fragaszy, D. M. (2015). Quantifying affordances. In Weast-Knapp, J., Malone, M., & Abney, D. (Eds.), *Studies in Perception and Action XIII* (pp. 199–202). New York, NY: Psychology Press.

Mangalam, M. & Karve, S. M. (2015). Comment on “Number-space mapping in the newborn chick resembles humans’ mental number line.” *Science* 348(6242), 1438–b.

Mangalam, M. & Fragaszy, D. M. (2015). Wild bearded capuchin monkeys crack nuts dexterously. *Current Biology* 25(10), 1334–1339.

Mangalam, M., Desai, N., & Singh, M. (2015). Division of labor in hand usage is associated with higher hand performance in free-ranging bonnet macaques, *Macaca radiata*. *PLoS ONE* 10(3), e119337.

Sfar, N., **Mangalam, M.**, Kaumanns, W., & Singh, M. (2014). A comparative assessment of hand preference in captive red howler monkeys, *Alouatta seniculus* and yellow-breasted capuchin monkeys, *Sapajus xanthosternos*. *PLoS ONE* 9(10), e107838.

Mangalam, M., Desai, N., & Singh, M. (2014). Do right-handed monkeys use the right cheek pouch before the left? *PLoS ONE* 9(5), e97971.

Mangalam, M., Desai, N., & Singh, M. (2014). Division of labor in hand usage in free-ranging bonnet macaques, *Macaca radiata*. *American Journal of Primatology* 76(6), 576–585.

Mangalam, M. & Singh, M. (2013). Flexibility in food extraction techniques in urban free-ranging bonnet macaques, *Macaca radiata*. *PLoS ONE* 8(12), e85497.

Mangalam, M. & Singh, M. (2013). Differential foraging strategies: Motivation, perception and implementation in urban free-ranging dogs, *Canis familiaris*. *Animal Behaviour* 85(2), 763–770.

Mangalam, M. & Singh, M. (2013). Sex and reproductive state influence the rate of resource acquisition and monopolisation in urban free-ranging dogs, *Canis familiaris*. *Behaviour* 150(4), 199–213.

Das, S., Dutta, S., **Mangalam, M.**, Verma, R., Rath, S., Singh, M., & Kumara, H. (2011). Prioritizing remnant forests for the conservation of Mysore slender lorises (*Loris lydekkerianus lydekkerianus*) in Karnataka, India through estimation of population density. *International Journal of Primatology* 32(5), 1153–1160.

NON PEER-REVIEWED PUBLICATIONS*

*Names of undergraduate mentees are underlined.

Rodriguez, I. & **Mangalam, M.** (2018). Motor thalamus and the neural control of ballistic movements. *Journal of Neuroscience* (Under review).

Karve, S. M. & **Mangalam, M.** (2016). Junior researchers: Hasty publication compromises rigour. *Nature* 531(7594), 305.

Nettimi, R. P., **Mangalam, M.**, & Singh, M. (2015). Why not be an early bird researcher? *Current Science* 108(6), 1027–1028.

MANUSCRIPTS*

*Names of undergraduate mentees are underlined.

Fragszky D. M. & **Mangalam, M.**. Controlling external degrees of freedom in humans and monkeys. (In preparation).

Mangalam, M., & Fragszky, D. M. Postural control: A neglected issue in the study of tooling. (In preparation).

Mangalam, M., Rein, R., Hafeez, P. A., & Fragszky, D. M. Joint synergies and motor skill in wild monkeys using stone hammers to crack open nuts. (In preparation).

Mangalam, M., Lambert, S. L., & Fragszky, D. M. The limitations of bottom-up multisensory integration in the sense of body ownership and agency. (In preparation).

Mangalam, M., Cutts, S. A., & Fragszky, D. M. Synchronous multisensory signals underlie the extension of the peripersonal space. (In preparation).

Mangalam, M., Conners, J. D., & Singh, T. Multifractality and long-range cross-correlation behavior is information is implicated in perception via dynamic touch. (In preparation).

Conners, J. D. & **Mangalam, M.** Perceptual invariance in tactile perception. (In preparation).

Mangalam, M., Roles, L. K. R., & Fragszky, D. M. Shared and distinct perceptuomotor control of stone hammers in humans and wild bearded capuchin monkeys. (In preparation).

MEDIA COVERAGE OF RESEARCH*

*Names of undergraduate mentees are underlined.

Mangalam, M., Pacheco, M. M., Izar, P., Visalberghi, E., & Fragszky, D. M. (2018). Unique perceptuomotor control of stone hammers in wild monkeys. *Biology Letters* 20170587.

Featured in:

The Franklin Chronicles New primate behavior study: Perceiving kinetic energy

Mangalam, M., Barton, S. A., Wagman, J. B., Fragszky, D. M., & Newell, K. M. (2017). Length of an object perceived through dynamic touch remains invariant across changes in the medium. *Attention, Perception, & Psychophysics* 79(8), 2499–2509.

Featured in:

Psychonomic Society The eigenvalues of lightsabers and submerged golden hammers

Mangalam, M., Izar, P., Visalberghi, E., & Fragszky, D. M. (2016). Task-specific temporal organization of percussive movements in wild bearded capuchin monkeys. *Animal Behaviour* 114, 129–137.

Featured in:

Animal Behaviour On tool use, and becoming human

Journal of Experimental Biology Monkeys alter tool use for different tasks

Zaunmair, P., **Mangalam, M.**, Kaumanns, W., Singh, M., & Slotta-Bachmayr, L. (2015). Patterns of dominance relationships among the females of a captive female-only group of lion-tailed macaques (*Macaca silenus*) during the course of the introduction of a new adult male. *Current Science* 109(4), 803–807.

Featured in:

Current Science Society of lion-tailed macaques

Mangalam, M. & Fragaçzy, D. M. (2015). Wild bearded capuchin monkeys crack nuts dexterously. **Current Biology** 25(10), 1334–1339.

Featured in:

BBC Radio Monkey nuts

Daily Mail This is how you should be cracking nuts!

Der Spiegel Raffinierte technik: So knacken affen nüsse

Discovery News Monkeys show how to perfectly crack a nut

EurekaAlert! Wild bearded capuchin monkeys really know how to crack a nut

Huffington Post Clever monkey demonstrates the proper way to crack a nut

Live Science Nut-cracking monkeys show humanlike skills

Mental Floss These monkeys wield makeshift hammers and anvils

National Geographic Nut-bashing monkeys offer window into human evolution

Nature World News These nut cracking monkeys would make great blacksmiths - use a hammer and anvil with deft

New Scientist Capuchin monkeys rival chimps as highly skilled nut-crackers

Pacific Standard Monkeys with talented hands

Science News Rock-wielding monkeys make adjustments when cracking nuts

Science Shot Clever monkeys adjust how hard they hammer nuts

The New York Times Monkeys provide clues to how tool use developed

Nettimi, R. P., **Mangalam, M.**, & Singh, M. (2015). Why not be an early bird researcher? **Current Science** 108(6), 1027–1028.

Featured in:

The Indian Express Education system does not foster the spirit of inquiry

Das, S., Dutta, S., **Mangalam, M.**, Verma, R., Rath, S., Singh, M., & Kumara, H. (2011). Prioritizing remnant forests for the conservation of Mysore slender lorises (*Loris lydekkerianus lydekkerianus*) in Karnataka, India through estimation of population density. **International Journal of Primatology** 32(5), 1153–1160.

Featured in:

The Hindu Loris clings on precariously here

The Times of India Study moots conservation of slender lorises' habitat

RESEARCH FUNDING

2017–19 **Committee for Research and Exploration, National Geographic Society | USD 29,226** WW-051R-17
"Nut-cracking in wild bearded capuchin monkeys: Patterns of coordination in movements"
w/ Dorothy M. Fragaçzy, Patrícia Izar, & Elisabetta Visalberghi

2016 **Innovative and Interdisciplinary Research Grant | USD 1,000**
Graduate School, University of Georgia

PUBLISHED ABSTRACTS

Mangalam, M. (2018). Haptic perception in motor control, at land, in water, in air, and in space, of a fish's fin, a flamingo's neck, a monkey's tail, a snake's spine, and a bat's wing. **Integrative & Comparative Biology** 58(suppl_1), e143.

Mangalam, M. & Fragaçzy, D. M. (2018). Joint synergies in nut cracking in wild bearded capuchin monkeys. **Integrative & Comparative Biology** 58(suppl_1), e371.

Mangalam, M., Matheus, M. M., & Fragaszy, D. M. (2017). How wild bearded capuchin monkeys crack nuts. *Integrative & Comparative Biology* 57(suppl_1), e337.

Mangalam, M., Roles, L. K. R., & Fragaszy, D. M. (2017). Wild bearded capuchin monkeys outperform humans in cracking nuts. *Integrative & Comparative Biology* 57(suppl_1), e104.

Mangalam, M. & Fragaszy, D. M. (2016). Embodied foundations of stone tool use shared by humans and bearded capuchin monkeys. *American Journal of Physical Anthropology* 159(S62), 218.

Mangalam, M. & Fragaszy, D. M. (2015). Wild bearded capuchin monkeys crack nuts dexterously. *Proceedings of the XVIII International Conference on Perception-Action* 86.

ORAL PRESENTATIONS

-
- 2018 **International Society for Ecological Psychology** Normal, IL | June 27–28
Wild monkeys structure motor variability to stand bipedally while using stone hammers.
- 2018 **Department of Organismal Biology and Anatomy, University of Chicago** Chicago, IL | March 12
What stone tool using wild monkeys can tell us about prehistoric toolmakers and cyborgs.
- 2018 **Society for Integrative & Comparative Biology** San Francisco, CA | Jan 3–7
Haptic perception in motor control, at land, in water, in air, and in space, of a fish's fin, a flamingo's neck, a monkey's tail, a snake's tongue, and a human's hand.
- 2017 **American Society for Primatologists** Washington, DC | Aug 25–28
Identifying distinguishing features of perceptuomotor control of stone tools in humans and bearded capuchin monkeys.
- 2017 **7th Annual Graduate Students & Postdocs in Science Day**, University of Georgia, Athens, GA | April 17
Perceptual-motor control of stone tools in wild monkeys: Implications for the origins of stone-tool manufacture in hominins.
- 2017 **40th Annual Psi Chi Convention**, University of Georgia, Athens, GA | April 14
Perceptual-motor control of stone tools in wild monkeys: Implications for the origins of stone-tool manufacture in hominins.
- 2017 **Society for Integrative & Comparative Biology** New Orleans, LA | Jan 4–8
How wild bearded capuchin monkeys crack nuts.
- 2016 **International Society for Ecological Psychology** Clemson, SC | June 20–22
Biomechanical analysis of the affordances of anvil-and-hammer tools in wild bearded capuchin monkeys.
- 2016 **American Association of Physical Anthropologists** Atlanta, GA | April 13–16
Embodied foundations of stone tool use shared by humans and bearded capuchin monkeys.
- 2015 **XVIII International Conference on Perception-Action** Minneapolis, MN | July 14–18
Wild bearded capuchin monkeys crack nuts dexterously.

POSTER PRESENTATIONS

-
- 2018 **International Society for Ecological Psychology** Normal, IL | June 27–28
Point of percussion influences perception of the length of a wielded object via dynamic touch by striking.
- 2018 **Society for the Neural Control of Movement** Santa Fe, NM | April 30–May 4
Wild monkeys structure motor variability to maintain a stable bipedal stance while using stone hammers.
- 2018 **Society for Integrative & Comparative Biology** San Francisco, CA | Jan 3–7
Joint synergies in nut cracking in wild bearded capuchin monkeys.
- 2017 **Society for Integrative & Comparative Biology** New Orleans, LA | Jan 4–8
Wild bearded capuchin monkeys outperform humans in cracking nuts.
- 2016 **International Society for Ecological Psychology** Clemson, SC | June 20–22
Wild bearded capuchin monkeys use their semi-prehensile tail as a cantilever of adjustable length.
- 2015 **XVIII International Conference on Perception-Action** Minneapolis, MN | July 14–18
Quantifying affordances.

PROFESSIONAL MEMBERSHIPS

AD-HOC REVIEWERSHIPS

Animal Cognition | Behavioural Processes | Behavioural Brain Research | Biology Letters | Current Science | Journal of Biosciences | Journal of Comparative Psychology | Nature

AWARDS, FELLOWSHIPS, & GRANTS

- 2018 **Departmental Teaching Assistantship | USD 15,642**
Department of Psychology, University of Georgia
- 2018 **Graduate School Travel Grant | USD 775**
Graduate School, University of Georgia
- 2017–18 **Departmental Teaching Assistantship | USD 21,660**
Department of Psychology, University of Georgia
- 2017 **Graduate School Travel Grant | USD 775**
Graduate School, University of Georgia
- 2017 **Walter Isaac Travel Award | USD 300**
Department of Psychology, University of Georgia
- 2016–17 **Departmental Teaching Assistantship | USD 18,696**
Department of Psychology, University of Georgia
- 2016 **Departmental Teaching Assistantship | USD 2,268**
Department of Psychology, University of Georgia
- 2016 **Walter Isaac Travel Award | USD 300**
Department of Psychology, University of Georgia
- 2015–16 **Departmental Teaching Assistantship | USD 18,144**
Department of Psychology, University of Georgia
- 2015 **Honorary Domestic Travel Assistance | INR 11,000**
Biopsychology Laboratory, University of Mysore
- 2015 **Foreign Travel Assistance | USD 1,850**
OVPR, University of Georgia
- 2015 **Walter Isaac Travel Award | USD 300**
Department of Psychology, University of Georgia
- 2015 **Outstanding Publication Award**
Department of Psychology, University of Georgia
- 2014–15 **Ph.D. Scholars of Excellence Assistantship | USD 21,000**
Department of Psychology, University of Georgia
- 2015 **Education Related Travel Grant | INR 40,000**
Sir Dorabji Tata Trust, India
- 2007–12 **Inspire Fellowship | INR 287,500**
Department of Science & Technology, India
- 2010 **Summer Research Fellowship | INR 12,000**
Indian Academy of Sciences, India
- 2010 **Spirit of Invention Award | INR 5,000**
National Chemical Laboratory, India

TEACHING EXPERIENCE

RESEARCH ANALYSIS IN PSYCHOLOGY | TEACHING ASSISTANT

August 2018 – December 2018 | University of Georgia

COGNITIVE NEUROSCIENCE | INSTRUCTOR OF RECORD

July 2018 | University of Georgia

RESEARCH ANALYSIS IN PSYCHOLOGY | TEACHING ASSISTANT

January 2018 – May 2018 | University of Georgia

ANIMAL COGNITION & PERCEPTION | GUEST LECTURER

March 2018 | University of Georgia

SENSATION & PERCEPTION | GUEST LECTURER

October 2017 | University of Georgia

RESEARCH DESIGN IN PSYCHOLOGY | TEACHING ASSISTANT

August 2017 – December 2017 | University of Georgia

COGNITIVE PSYCHOLOGY | TEACHING ASSISTANT

Jan 2017 – May 2017 | University of Georgia

PHYSIOLOGICAL & COMPARATIVE PSYCHOLOGY | TEACHING ASSISTANT

August 2016 – December 2016 | University of Georgia

PSYCHOPHARMACOLOGY | TEACHING ASSISTANT

June 2016 – July 2016 | University of Georgia

ANIMAL COGNITION | GUEST LECTURER

January 2016 – May 2016 | University of Georgia

ELEMENTARY PSYCHOLOGY | TEACHING ASSISTANT

August 2015 – May 2016 | University of Georgia

STATISTICS | GUEST LECTURER

January 2013 – May 2013 | University of Mysore

EVOLUTION | GUEST LECTURER

August 2012 – December 2012 | University of Mysore

UNDERGRADUATE MENTORSHIP

2018	Pakeeza A. Hafeez Psychology & Biology Major, University of Georgia
2018	Peyton Niebanck Fisheries and Wildlife Major, University of Georgia
2018	Ryan Chen Kinesiology Major, University of Georgia
2018	Sarah Cutts Psychology & Neuroscience Major, University of Georgia
2018	Sophia L. Lambert Psychology & Neuroscience Major, University of Georgia
2018	Terrence R. Mchugh Kinesiology Major, University of Georgia
2017–18	James D. Conners Psychology & Communications Major, University of Georgia James received William T. James Award given to an Outstanding Senior Major in Psychology
2017	Carlos R. Corea Linguistics & Psychology Major, University of Georgia
2017	Lillian A. Stamps Psychology Major, University of Georgia
2017	Tinikki C. Gibbs Psychology Major, University of Georgia
2016	Sophie A. Barton Psychology & Neuroscience Major, University of Georgia
2015–16	Ashley Myers Biology & Psychology Major, University of Georgia
2015–16	Hiba Hafeez Psychology Major, University of Georgia
2015–16	Lindsey K. R. Roles Psychology & Neuroscience Major, University of Georgia
2015	James Y. Hammers Psychology Major, University of Georgia
2015	Leslea G. Motley Psychology Major, University of Georgia
2012–15	Ravindra P. Nettimi Biology Major, Indian Institute of Science Education and Research Pune
2012–15	Nisarg Desai Biology Major, Indian Institute of Science Education and Research Pune

REFEREES

DOROTHY M. FRAGASZY | PROFESSOR

Psychology, University of Georgia

doree@uga.edu | 706.338.3859 | 125 Baldwin St, Athens, GA 30602, USA

KARL M. NEWELL | PROFESSOR

Kinesiology, University of Georgia

kmn1@uga.edu | 814.571.1812 | 110 Carlton St, Athens, GA 30602, USA

TARKESHWAR SINGH | ASSISTANT PROFESSOR

Kinesiology, University of Georgia

sabat@uga.edu | 706.542.4385 | 110 Carlton St, Athens, GA 30602, USA

DEAN SABATINELLI | ASSOCIATE PROFESSOR

Psychology, University of Georgia

sabat@uga.edu | 706.542.3094 | 125 Baldwin St, Athens, GA 30602, USA

PATRÍCIA IZAR | PROFESSOR

Experimental Psychology, University of São Paulo

patrizar@usp.br | +55 11.091.4358 | Av. Professor Mello Moraes, 1721 Butantã, São Paulo, SP 05508-030, Brazil

MEWA SINGH | LIFE-LONG DISTINGUISHED PROFESSOR

Psychology, University of Mysore

msingh@psychology.uni-mysore.ac.in | +91 944.860.3506 | Manasagangotri, Mysore, KA 570006, India

SUTIRTH DEY | ASSOCIATE PROFESSOR

Indian Institute of Science Education and Research Pune

s.dey@iiserpune.ac.in | +91 020.2590.8054 | Dr. Homi Bhabha Rd, Pashan, Pune, MH 411008, India
