

Morgan Leigh Turner

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EDUCATION

In progress Ph.D. Candidate, Ecology and Evolutionary Biology, Brown University
2018 M.S. Ecology and Evolutionary Biology, Brown University
2013 B.A. Biological Anthropology and Paleobiology, University of Washington, Seattle

CERTIFICATES

2017 Reflective Teaching, Sheridan Center for Teaching and Learning, Brown University
2013 Natural Science Illustration, School of Professional and Continuing Education, University of Washington, Seattle

HONORS AND AWARDS

2020 Society of Integrative and Comparative Biology Grant in Aid for Research: "The impact of interdigital substrate flow on theropod dinosaur footprint diversity" \$706.10
2019 EEB Doctoral Dissertation Enhancement Grant: "Postural Grades and Foot Function Gradients in Archosaurs" \$12,343
2018 IEEE VIS (Visual analytics science and technology, Information visualization, Scientific visualization) Best Poster Award
2016 NSF Graduate Research Fellowship Program Honorable Mention

PEER-REVIEWED PUBLICATIONS

Tsai HP, **Turner ML**, Manafzadeh AR, Gatesy SM. (2020). Contrast-enhanced XROMM reveals in vivo soft tissue interactions in the hip of *Alligator mississippiensis*. *Journal of Anatomy*. (doi:10.1111/joa.13101)
Novotny J, Tveite J, **Turner ML**, Gatesy SM, Drury F, Falkingham P, Laidlaw DH. (2019). Developing Virtual Reality Visualizations for Unsteady Flow Analysis of Dinosaur Track Formation using Scientific Sketching. *IEEE Transactions on Visualization and Computer Graphics*.
Farlow JO, Robinson NJ, **Turner ML**, Black J, Gatesy SM. (2018). Footfall Pattern of a Bottom-Walking Crocodile (*Crocodylus acutus*). *Palaos* 33(9):406-413.
Turner ML, Sidor CA. (2017). Pathology in a Permian Parareptile: Congenital Malformation of Sacral Vertebrae. *Journal of Zoology*. DOI:10.1111/jzo.12519.

Turner ML, Tsuji LA, Ide O, Sidor CA. (2015). The vertebrate fauna of the Upper Permian of Niger—IX. The appendicular skeleton of *Bunostegos akokanensis* (Parareptilia: Pareiasauria). *Journal of Vertebrate Paleontology* 35, e994746.

Manuscripts in revision/review

Turner ML, Falkingham P, Gatesy SM. (*in review*). What is ‘Stance’ on Deformable Substrates? Submitted to Proceedings of the Royal Society Open Science.

PRESENTATIONS

Invited Seminars

- 2019 “3-D Data Visualization Development in VR” CCV-Con, Center for Computation and Visualization, Brown University
- 2019 “Ecology of East Africa, Tanzania Trip Report” Ecology and Evolutionary Ecology Brown Bag Seminar, Brown University
- 2018 “Where does footprint morphology come from? Integrating 3D methods for exploring dinosaur track formation” Ecology and Evolutionary Ecology Brown Bag Seminar, Brown University
- 2018 “Plagiarism and Predatory Journals.” Initiative to Maximize Student Development, Brown University
- 2017 “Dinosaur Feet Underground: Visualizing, Aligning, and Comparing Toe Path Trajectories” Scientific Visualization Group, Department of Computer Science, Brown University
- 2016 “Pareiasaurs and Paleart” Ecology and Evolutionary Ecology Brown Bag Seminar, Brown University

Invited and Contributed Conference Presentations

Turner ML and Gatesy SM. (2020). Looking inside the sole: intermetatarsal mobility in the *American alligator*. *Society of Integrative and Comparative Biology Annual Meeting*.

Capano JG, Brainerd EL, **Turner ML**, Ryerson WG. (2019). Cranial Kinesis During Prey Ingestion in the Reticulated Python. *Northeastern Regional Meeting of the Society of Integrative and Comparative Biology Division of Vertebrate Morphology and Comparative Biomechanics*.

Turner ML, Novotny J, Falkingham PL, Laidlaw DH, Gatesy SM. (2019). Where does footprint morphology come from? Developing virtual reality visualizations for exploring dinosaur track formation. *International Congress of Vertebrate Morphology*. (Invited symposium talk).

Falkingham PL, **Turner ML**, Gatesy SM. (2019). Generating and Testing Hypotheses of Dinosaur Foot Motions Using 3D-Digitized Tracks and Large-Scale Granular Simulations. *International Congress of Vertebrate Morphology*.

Novotny J, Tveite JJ, **Turner ML**, Gatesy SM, Falkingham PL, Laidlaw, DH. (2018). Developing a Virtual Reality Application for Unsteady Flow Analysis in Dinosaur Track Creation. IEEE VIS (Visual analytics science and technology, Information visualization, Scientific visualization). (Best Poster Award)

- Turner ML**, Falkingham PL, Gatesy SM. (2018). Where does footprint morphology come from? Integrating 3D methods for exploring dinosaur track formation. *Society of Vertebrate Paleontology Annual Meeting*. (Invited symposium talk).
- Tsai HP, **Turner ML**, Manafzadeh AR, Gatesy SM. (2018). Contrast-enhanced XROMM reveals in vivo soft tissue interaction in the hip of Alligator mississippiensis: implications for pseudosuchia. *Society of Vertebrate Paleontology Annual Meeting*.
- Farlow JO, Robinson NJ, **Turner ML**, Black J, Gatesy SM. (2018). Footfall Pattern of a Bottom-Walking Crocodile (*Crocodylus acutus*). *Society of Vertebrate Paleontology Annual Meeting*.
- Turner ML**, Gatesy SM. (2018). Intra-foot kinematics of the American alligator. *Northeastern Regional Meeting of the Society of Integrative and Comparative Biology Division of Vertebrate Morphology and Comparative Biomechanics*.
- Turner ML**, Falkingham PL, Gatesy SM. (2018). Avian subsurface foot kinematics on deformable substrates. *Society for Integrative and Comparative Biology Annual Meeting*.
- Gatesy SM, **Turner ML**, Falkingham, PL. (2018). CT Imaging of Dinosaur Footprints: Hidden Topography and the Origin of Track Diversity. *Society for Integrative and Comparative Biology Annual Meeting*.
- Napoli JG, Tsai HP, **Turner ML**, Manafzadeh AR, Gatesy SM. (2018). In- and Ex-Vivo Analysis of the Kinematics and Function of the Tendon of Sutton in Alligator mississippiensis. *Society for Integrative and Comparative Biology Annual Meeting*.
- Tsai HP, **Turner ML**, Manafzadeh AR, Gatesy SM. (2018). Significance of hip kinematics for interpreting articular soft tissue function in Alligator mississippiensis. *Society for Integrative and Comparative Biology Annual Meeting*.
- Turner ML**, Falkingham PL, Gatesy SM. (2017). Sub-Surface Foot-Trajectories and Fossil Dinosaur Tracks. *Last Days of Pangea Triassic-Jurassic Research Symposium*.
- Tsai HP, **Turner ML**, Manafzadeh AR, Gatesy SM. (2017). Significance of hip kinematics for interpreting articular soft tissue function in Alligator mississippiensis: evolutionary and biomechanical implications for Saurischia. *Last Days of Pangea Triassic-Jurassic Research Symposium*.
- Turner ML**, Falkingham PL, Gatesy SM. (2016). The morphology of motion in sub-surface foot trajectories and fossil dinosaur tracks. *Northeastern Regional Meeting of the Society of Integrative and Comparative Biology Division of Vertebrate Morphology and Comparative Biomechanics*.
- Tsai HP, **Turner ML**, Manafzadeh AR, Gatesy SM. (2016). Hip joint kinematics of Alligator mississippiensis: Significance of articular soft tissues for interpreting hind limb function. *Northeastern Regional Meeting of the Society of Integrative and Comparative Biology Division of Vertebrate Morphology and Comparative Biomechanics*.
- Turner ML**, Falkingham PL, Gatesy SM. (2016). The morphology of motion in sub-surface foot trajectories and fossil dinosaur tracks. *Society of Vertebrate Paleontology Annual Meeting*.
- Turner ML**, Falkingham PL, Gatesy SM. (2016). The morphology of motion: sub-surface foot trajectories and fossil tracks. *International Congress of Vertebrate Morphology*.
- Turner ML**, Sidor CA, Tsuji LA. (2015). Removing assumptions of anatomical orientation from cladistic characters: an example from pareiasaurs. *Society of Vertebrate Paleontology Annual Meeting*.

- Turner ML**, Tsuji LA, Sidor CA. (2014). Evidence for the earliest evolution of a fully parasagittal quadruped. *Society of Vertebrate Paleontology Annual Meeting*.
- Turner ML**, Tsuji LA, Sidor CA. (2013). The Ontogeny of the Scapulocoracoid of the Pareiasaur *Bunostegos akokanensis* (Amniota: Parareptilia) from the Permian of Niger. *Undergraduate Research Symposium, University of Washington*.

TEACHING & MENTORSHIP

Teaching

- 2019 Gross Human Anatomy II, Warren Alpert Medical School
Special Projects TA
- 2018 Gross Human Anatomy I, Warren Alpert Medical School
Special Projects TA
Gross Human Anatomy II, Warren Alpert Medical School
TA
- 2017 Gross Human Anatomy I, Warren Alpert Medical School
TA
Virtual Reality Design for Science, Brown Univ. + Rhode Island School of Design
Lecturer and Science Contributor
Gross Human Anatomy II, Warren Alpert Medical School
TA
- 2016 Gross Human Anatomy I, Warren Alpert Medical School
TA
- 2015 Virtual Reality Design for Science, Brown Univ. + Rhode Island School of Design
Lecturer and Science Contributor
- 2014 Evolution of Mammals and their Ancestors, University of Washington
Peer TA
- 2013 Comparative Anatomy of Vertebrates, University of Washington
Peer TA

Undergraduate Student Mentorship

- 2018 – 2019 Eli Mitnik, Brown University undergraduate

Workshops

- 2019 Virtual Reality DinoYurt application demonstrations (featured in the Novotny et al. 2019 paper) at the Virtual Morphology (VirtMorph) symposium, International Congress of Vertebrate Morphology conference, Prague, Czechia

SERVICE

University/Departmental

- 2018 – 2020 Vice President, Department of Ecology and Evolutionary Biology Graduate Student Association, Brown University
- 2017 Graduate Student Council Representative, Brown University

Community

- 2019, 20 "Brown Junior Researcher Program" Francis J Varieur Elementary, Pawtucket, RI
- 2019 Judge, Rhode Island Science and Engineering Fair, Warwick, RI
- 2018 Scientist Guest, Wild Ones, Providence, RI
- 2018 Virtual Reality demonstrations for high school students, Brown University, RI
- 2017, 18 "Brown Junior Researcher Program" Boys and Girls Club, East Providence, RI
- 2017 Graduate Student Panel, Wheaton College Summit for Women in STEM
- 2017 "Geo Vartan Gregorian Volunteer Program" Vartan Gregorian Elementary, Providence RI
- 2014 "Dinosaurs and Cavemen" Department of Pathology and Anatomical Sciences, University of Missouri
- 2014 "Behind the Scenes Night" Burke Museum of Natural History and Culture, University of Washington
- 2012, 14, 15 "Dino Day" Burke Museum of Natural History and Culture, University of Washington

Reviewing

Zoological Journal of the Linnean Society
Anatomical Record

RESEARCH EXPERIENCE

Live Animals

Trained operator of Keck X-ray Reconstruction of Moving Morphology (XROMM) facility and involved with live animal data acquisitions from many projects over the last few years.

- 2019 Python – handling, surgery, XROMM setup and recording
- 2017, 18 Boa Constrictor – handling, surgery
- 2016, 18 Alligator – handling, surgery, husbandry, training, XROMM setup and recording
- 2016 Tegu – surgery
- 2016 Stingray – XROMM recording
- 2015 Human – XROMM setup and recording

Surgery

Induction, intubation, intraoperative, post-operative management, including maintenance of anesthesia using isoflurane and monitoring ECG, SpO2, BP, etc. Also trained in surgical techniques, aseptic practices, controlled substances, euthanasia methods.

Model Making, Animation, and Visualization

Segmenting and thresholding Computed Tomography (CT) scans of limbs in Amira, converting to 3-D bone models in GeoMagic, creating animatable ‘puppets’ in Maya, and applying 3-D xyz coordinates from X-ray video data tracked in XMA Lab to create an animated skeleton ready for analysis

Forward and inverse kinematics foot animation from fossil footprints and live data

Camera tracking or “match moving,” reconstructing a natural environment from a moving camera for animal motion analysis

Custom visualization development using 3-D data

Custom interface development for exploring large volumes of kinematic data

Fieldwork

2015 Connecticut River Valley, New England (Dinosaur Tracks)
2014 John Day Fossil Beds, Oregon (Miocene Mammals)
2014 Tri-Cities, Washington (Mammoths)

MUSEUM POSITIONS HELD

2014 – 2015 Casting and Molding Technician, Burke Museum of Natural History and Culture, University of Washington
2012 – 2015 Research Assistant (Dr. Christian Sidor, Dr. Linda Tsuji), University of Washington
2009 – 2012 Volunteer Fossil Preparator, Burke Museum of Natural History and Culture, University of Washington

ILLUSTRATION AND SHOWS

2017 “Discover: A Conversation Between Art and Science,” Rhode Island School of Design and Brown Collaboration Show
2016 “Art of Science” Exhibition, Brown University
2014 – 2016 Cartographer, African Safari Company
2014 Artist in Residence, John Day Fossil Beds National Monument, Oregon
2013 – 2016 Scientific Illustrator, Dept. Biology and Burke Museum of Natural History and Culture, University of Washington
2013 Natural Science Illustration Portfolio Show, Burke Museum of Natural History and Culture, University of Washington

SKILLS

Imaging Techniques	X-ray operator for XROMM and CT
Computer Programs	Adobe Photoshop, Adobe Illustrator, Amira, Arduino IDE, Autodesk Maya, Fidex CT software, GeoMagic, Horos, Igor, MakerWare by MakerBot, MatchMover, Phantom Camera Control for XROMM, Tinkercad, XMA Lab
Computer Languages	Proficient: Maya Embedded Language (MEL), Intermediate: R, Elementary: C/C++ and Python
Practical	3D printing, animal husbandry and handling, casting and molding, Arduino hardware control, dissection, experimental design, fossil preparation, instrumentation, survival animal surgery, visual design

AFFILIATIONS

2016- Graduate Women in Science
2016- International Society of Vertebrate Morphology
2015- Society for Integrative and Comparative Biology
2014- Society of Vertebrate Paleontology