CATALINA MANTILLA, Ph.D.
PROFESSIONAL BIOGRAPHICAL OUTLINE

BACKGROUND

Dr. Mantilla received a Bachelor of Science in Biology from the Pontificia Universidad Javeriana in Bogotá, Colombia. She completed her Master of Science in Biology from Florida International University, and her doctoral degree (Ph.D.) from Temple University, both with a focus on locomotion and Biomechanics.

Dr. Mantilla has over 10 years of experience in collaborative and integrative environments, developing investigative projects, formulating and testing hypothesis, and generating quantitative and qualitative data. She is knowledgeable in analyzing data using advanced kinematics, statistical, and computer-based simulation tools. Through thorough research and coursework, she gained a solid background in physics, math, statistics, anatomy, morphology, and biomechanics. She has extensive experience delivering engaging presentations at national and international conferences with excellent communication and writing skills.

Dr. Mantilla's masters and doctoral investigations focused on evaluating the body's response to changes in substrate properties and inclination during locomotion. For her doctoral dissertation, she specifically assessed locomotion over compliant particle-composed ground commonly found in outdoor environments (i.e. gravel, sand), which can cause challenging incidents, such as slips and trips. By accurately measuring foot/leg kinematics using high-speed 2D/3D motion tracking, and analyzing particle dynamics in response to these kinematics, her investigation revealed novel strategies to compensate for substrate changes and maintain affective performance during locomotion.

AREAS OF EXPERTISE

- Biomechanics
- Human Kinematic Analysis and Testing
- Building Codes and Standards
- Gait Analysis
- Joint Kinematics
- Human Factors
- Slip/Trip and Fall Analysis

EDUCATION

- Ph.D. Biology/Biomechanics, Temple University, PA, 2021
  - *Dissertation: "Kinematics and Dynamics of running up granular slopes"*
- Master of Science, Biology/Biomechanics, Florida International University, FL, 2016
  - *Thesis: "Kinematics of incline running when using claws and toepads in Caribbean anole lizards"*
- Bachelor of Science, Biology, Pontificia Universidad Javeriana, Bogotá, Colombia, 2005
  - *Thesis: "Myological Description of the foot-leg mechanical unit of a Caribbean anole lizard"*

PROFESSIONAL EXPERIENCE

November 2022 – Present | ARCCA, Incorporated | Senior Biomechanist

- Applies the principles of human factors and biomechanics to evaluate incidents related to slips/trips and falls.
- Performs inspections, testing, and analyses using concepts driven from human factors, biomechanics and building codes and standards.
- Investigates incidents involving personal injuries and premises liability using building codes and standards.
- Provides professional expertise on human factors, biomechanical, and injury causation analyses.

January 2022 – May 2022 | Temple University's College of Science and Technology: Biology | Adjunct Assistant Professor

- Taught laboratory component of General Biology course, achieving upper-level instructor performance based on semester student feedback evaluations.

August 2017 – December 2017 | Temple University's Animal Locomotion and Comparative Biomechanics Laboratory | Research Assistant

- Worked on novel research investigating surface and sub-surface foot use and foot-ground interactions of lizards moving on compliant ground such as granular media.
- Implemented high-speed and 2D motion tracking methods to obtain surface foot and leg kinematic measurements.
- Collaborated with The Ross Lab at the University of Chicago XROMM (X-ray Reconstruction of Moving Morphology) facility to obtain high-speed 3D cineradiography data for sub-surface kinematic analyses.
- Combined the use of different 3D modeling tools such as Blender, Autodesk® Fusion360, MeshLab, and Meshmixer to design 3D models of lizards' feet from obtained micro-CT scans.
- Troubleshooted and successfully implemented 3D models of lizards' feet into Discrete Element Method simulations in LIGGGHTS® of feet impacting an inclined block of particles.
- Designed, conducted and interpreted quantitative analyses.
- Performed statistical analyses using R, JMP and MATLAB.
- Prepared and delivered engaging presentations at national and international conferences with highlighted acceptance among assistants.

August 2012 – August 2016 | Florida International University's Animal Locomotion and Comparative Biomechanics Laboratory | Research Assistant

- Investigated foot use in Caribbean anole lizards during incline running.
- Implemented high-speed and 2D motion tracking methods to obtain surface foot and leg kinematic measurements.
- Designed, conducted and interpreted quantitative analyses.
- Performed statistical analyses using R, JMP and MATLAB.

- Prepared and delivered engaging presentations at national conferences.
- Interviewed at a national conference by a member of the Anole Annals active blog to write a story about delivered presentation.

TEACHING EXPERIENCE

- Fall 2012 **Teaching Assistant**, Comparative Vertebrate Anatomy, Florida International University.
- Spring 2013 **Teaching Assistant**, General Biology II, Florida International University.
- Summer 2013 **Teaching Assistant**, General Biology II, Florida International University.
- Fall 2013. **Teaching Assistant**, Comparative Vertebrate Anatomy, Florida International University.
- Summer 2014 **Teaching Assistant**, General Biology II, Florida International University.
- Fall 2014. **Teaching Assistant**, Comparative Vertebrate Anatomy, Florida International University.
- Summer 2015 **Teaching Assistant**, General Biology II, Florida International University.
- Spring 2016 **Teaching Assistant**, General Biology II, Florida International University.
- Fall 2016 **Head Teaching Assistant**, General Biology II, Florida International University
- Spring 2017 **Head Teaching Assistant**, General Biology II, Florida International University
- Summer 2017 **Head Teaching Assistant**, General Biology II, Florida International University
- Fall 2017 **Teaching Assistant**, General Biology I, Temple University
- Spring 2018 **Teaching Assistant**, General Biology II, Temple University
- Fall 2018 **Teaching Assistant**, General Biology I, Temple University
- Spring 2019 **Teaching Assistant**, General Biology II, Temple University
- Fall 2019 **Teaching Assistant**, General Biology I, Temple University
- Spring 2020 **Head Teaching Assistant**, General Biology II, Temple University

CERTIFICATIONS & AWARDS

- **Teaching in Higher Education Certificate,** Temple University**, 2017**
- **American Museum of Natural History (AMNH) Collection Study Grant**, 2014. $800
- **Fellowship of Graduate Student Travel (FGST)**, The Society for the Integrative and Comparative Biology (SICB), 2019, $2,000
- **Sigma Xi Grants in Aid of Research (GIAR)**, Sigma Xi The Scientific Research Honor Society, 2019, $1,000
- **Doctoral Dissertation Completion Grant**, Temple University, 2021, $11,000

PROFESSIONAL PRESENTATIONS

Mantilla C., Tucker E.L., Hsieh S.T. "Subsurface foot flexibility and positioning may improve running performance on granular slopes". Society for the Integrative and Comparative Biology (SICB) Annual Meeting. Virtual presentation. Phoenix, Arizona. 2022

Mantilla C., Tucker E.L., Chang B., Hsieh S.T. "Sand specialists and non-specialists use similar kinematic strategies when running on incline granular media". Society for the Integrative and Comparative Biology (SICB) Annual Meeting. Austin, Texas. 2020

Mantilla C., Tucker E.L., Chang B., Hsieh S.T. "Kinematics of specialist and generalist lizards running on level and incline granular media". Society for the Integrative and Comparative Biology (SICB) Annual Meeting. Tampa, Florida. 2019

Mantilla C., Tucker E.L., Chang B., Hsieh S.T. "Cinemática de Lagartos Especialistas y Generalistas Corriendo Sobre Material Granular Horizontal e Inclinado". V Congreso Colombiano de Zoología. Bogota, Colombia. 2018

Mantilla C., Hsieh S.T. "The Role of Claws and Adhesive toepads in anole lizard Running Performance". BioSymposium of the Biology Department at Florida International University. Miami, Florida. 2017

Mantilla C., Hsieh S.T. "Evaluating the role of Claws and Toepads during running in Anole lizards". Society for the Integrative and Comparative Biology (SICB) Annual Meeting. New Orleans, Louisiana. 2017

Mantilla C., Hoyos J.M. "Myology of the Foot-Leg Mechanical Unit of Anolis antonii (Boulenger, 1908) (Squamata, Polychrotidae)". San Francisco, California. 2013

Mantilla C., Hoyos J.M. III Congreso Colombiano de Zoología. "Descripción Miológica de la Unidad Mecánica pie-pierna del lagarto *Anolis antonii* (Boulenger, 1908) (Squamata, Polychrotidae)". Medellin, Colombia. 2010

SELECT PUBLICATIONS

Hoyos, J.M., **Mantilla, D.C.**, Galindo, D, Salgar, L. 2014. Phylogenetic analysis within the *Pristimantis unistrigatus* (Anura, Craugastoridae) group based on morphological characters. *Caldasia*. 36(1):107-124. DOI: 10.15446/caldasia.v36n1.43894

Chang, B., Greenwood, A., **Mantilla, D.C**., Hsieh, S.T. *in prep*. Granular Media Force Response Due to Angled Instrusions and Angled Substrates.

Mantilla, D.C., Tucker, E.L., Chang, B., Hsieh, S.T. *in prep*. Surface kinematics of sand specialist and non-specialist lizards running on level and incline granular media.

Mantilla, D.C., Morales, S.D., Parra-Medina, R., Stroud, J.T. 2019. Histopathology of large epidermal cysts on the invasive Puerto Rican crested anole (*Anolis cristatellus*) in Miami, Florida USA. *Anolis Newsletter VII*, p. 154-157. Eds. Stroud, J.T., Geneva, A.J., Losos, J.B. Washington University, St. Louis MO.