Chase G Rock, M.S.

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EDUCATION

2017 – Present **School of Biological Sciences** **Georgia Institute of Technology**
Ph.D. Applied Physiology
GPA: 3.64/4.0

2015 – 2017 **Department of Biomechanics** **University of Nebraska at Omaha**
M.S. Exercise Science, concentration in Biomechanics
GPA: 4.0/4.0

2010 – 2014 **College of Arts and Sciences** **University of Nebraska at Omaha**
B.S. Neuroscience, minor degrees in Biology and Chemistry
GPA: 3.618/4.0 **GRE:** Quantitative – 158 Verbal – 163

RESEARCH

2017 – Present **School of Biological Sciences** **Georgia Institute of Technology**
Ph.D. Student Advisor: Dr. Young-Hui Chang
DISSERTATION PROJECT:
From Legs to Mind: Extent of Transfer of Adaptation to Reduced Gravity

2015 – 2017 **Department of Biomechanics** **University of Nebraska at Omaha**
Graduate Student Worker Advisor: Dr. Kota Takahashi
THESIS PROJECT:
Interaction Between Step-to-Step Variability and Metabolic Cost of Transport During Human Walking
OTHER PROJECTS:
Enhancing the Prosthetic Interface: Vibrotactile Socket Stimulation to Improve the Adaptability of Trans-tibial Amputees

Effect of Reduced Ankle Push-off on Gait Variability in Healthy Adults

Quantifying Stride-to-Stride Fluctuations in Amputee Gait: Implications for Improved Rehabilitation

2014 – 2015 **Biomechanics Research Building** **University of Nebraska at Omaha**
Undergraduate Research Assistant Advisor: Dr. Shane Wurdeman
PROJECTS:
Quantifying Stride-to-Stride Fluctuations in Amputee Gait: Implications for Improved Rehabilitation

Implications of changes in prosthetic feet on motor control in amputee gait

Effects of Walking/Running Speed on Dynamic Stability

PUBLICATIONS

Rock CG, Wurdeman SR, Stergiou N, & Takahashi KZ *Stride-to-stride fluctuations in transtibial amputees are not affected by changes in push-off mechanics from using different prostheses.* PLOS ONE (in review)

Rock CG, Marmelat V, Yentes J, Siu KC, & Takahashi KZ *Interaction Between Step-to-Step Variability and Metabolic Cost of Transport During Human Walking.* Journal of Experimental Biology (in review)

GRANTS & FELLOWSHIPS

AWARDED

President's Fellowship **Georgia Institute of Technology**
Aim: To pursue doctoral research in the Comparative Neuromechanics Laboratory at the Georgia Institute of Technology.
Funding: $5,500/year for up to 4 years, starting August 2017

Graduate Research Fellowship Program **National Science Foundation**
Aim: To pursue research in the fields of biomechanics, neuroscience, and physiology, via the evaluation of energy expenditure and step patterns of human walking.
Funding: $138,000 from August 2017 – August 2022

NASA Nebraska Space Grant Fellowship **NASA Nebraska Space Grant Consortium**
Aim: To investigate the relationship between step-to-step variability and metabolic cost of transport during human walking, with implications for rehabilitation of those returning from spaceflight.
Funding: $4,000 from August 2016 – May 2017

Graduate Research and Creative Activity award **University of Nebraska at Omaha**
Aim: To determine the correlational and causal relationship between human walking and metabolic cost of transport.
Funding: $5,000 from June 2016 – May 2017

NOT AWARDED

Graduate Research Fellowship Program **National Science Foundation**
Aim: To pursue research in the fields of biomechanics, neuroscience, and physiology, via the evaluation of energy expenditure and step patterns of human walking.
Funding: $138,000 from August 2016 – August 2021

AWARDS, HONORS, & MEMBERSHIPS

2017 – Present **Secretary, PAPER (Promoting Applied Physiology Education and Research)**
2016 **Delsys 2016 Student Travel Grant**, Delsys, Inc.
2016 – Present **Member of American Society of Biomechanics**
2014 **Magna Cum Laude Graduate**, University of Nebraska at Omaha
2013 – Present **Member of Nu Rho Psi,** National Honor Society in Neuroscience
2010 – 2014 **Regents Scholar,** University of Nebraska at Omaha

PRESENTATIONS

Rock CG, Marmelat V, Yentes J, & Takahashi KZ *Relationship Between Step-to-Step Variability and Metabolic Cost of Transport in Human Walking.* **Podium**
2nd Annual Human Movement Variability Conference, Omaha, NE. 2017

Rock CG, Marmelat V, Yentes J, & Takahashi KZ *Relationship Between Step-to-Step Variability and Metabolic Cost of Transport in Human Walking.* **Podium**
7th Annual Meeting of the Rocky Mountain American Society of Biomechanics, Estes Park, CO. 2017

Rock CG, Marmelat V, Yentes J, & Takahashi KZ *Efficient Variability: Linking Fractal Walking Patterns with Metabolic Energy Savings.* **Podium**
Nebraska Academy of Sciences Annual Meeting, University of Nebraska at Lincoln, Lincoln, NE. 2017

Rock CG, Marmelat V, Yentes J, & Takahashi KZ *Efficient Variability: Linking Fractal Walking Patterns with Metabolic Energy Savings.* **Podium**
Research and Creative Activity Fair, University of Nebraska at Omaha, Omaha, NE. 2017

Rock CG, Marmelat V, Yentes J, & Takahashi KZ *Relationship Between Metabolic Cost of Transport and Stride-to-Stride Variability.* **Poster**
Symposium on Biomechanics, University of Nebraska at Omaha, Omaha, NE. 2016

Rock CG, Wurdeman SR, Stergiou N, & Takahashi KZ *Relationship Between Prosthetic Push-Off Work And Stride-To-Stride Fluctuations In Transtibial Prosthesis Users.* **Poster**
40th Annual Meeting of the American Society of Biomechanics, Raleigh, NC. 2016

Papachatzis N, **Rock CG**, Stergiou N, Takahashi KZ *Effects of Unilateral Push-Off Deficiency on Stride-To-Stride Fluctuations During Human Walking.* **Podium**
40th Annual Meeting of the American Society of Biomechanics, Raleigh, NC. 2016

Rock CG, Marmelat V, Yentes J, & Takahashi KZ *Metabolic Cost of Transport and the Persistence of Stride-to-Stride Fluctuations in Human Walking.* **Poster**
1st Annual Human Movement Variability Conference, Omaha, NE. 2016

Papachatzis N, **Rock CG**, Stergiou N, Takahashi KZ *Push-Off Mechanics and Stride-To-Stride Fluctuations During Human Walking.* **Poster**
Dynamic Walking, University of Michigan, Camp Ohiyesa, MI. 2016

Rock CG, Marmelat V, Yentes J, & Takahashi KZ *Metabolic Cost of Transport and the Persistence of Stride-to-Stride Fluctuations in Human Walking.* **Poster**
6th Annual Meeting of the Rocky Mountain American Society of Biomechanics, Estes Park, CO. 2016

Papachatzis N, **Rock CG**, Stergiou N, Takahashi KZ *Push-Off Mechanics and Stride-To-Stride Fluctuations During Human Walking.* **Poster**
6th Annual Meeting of the Rocky Mountain American Society of Biomechanics, Estes Park, CO. 2016

Rock CG, Wurdeman SR, Stergiou N, & Takahashi KZ *Relationship Between Prosthetic Push-Off Work And Stride-To-Stride Fluctuations In Transtibial Prosthesis Users.* **Poster**
Research and Creative Activity Fair, University of Nebraska at Omaha, Omaha, NE. 2016

Rock CG *Metabolic Cost and Long-Term Correlations in Human Gait.* **Podium**
School of HPER Seminar Series, University of Nebraska at Omaha, Omaha, NE. 2015

UNDERGRADUATE STUDENT MENTEES

Fall 2015 – Fall 2017	**Angel Gonzalez**	Major: Physical Education, conc. in Exercise Science
Summer 2016	**Emily Newton**	Major: Neuroscience
Spring 2017 – Fall 2017	**Aaron Robinson**	Major: Physical Education, conc. in Exercise Science
Spring 2017 – Fall 2017	**TeSean Wooden**	Majors: Biomechanics and Exercise Science

COMMUNITY OUTREACH & VOLUNTEER EXPERIENCE

2018 **Applied Physiology Outreach Presenter,** Institute for Robotics and Intelligent Machines Research Showcase, Georgia Institute of Technology

2018 **Applied Physiology Outreach Presenter,** Graduate Student Research Symposium, Department of Biological Sciences, Georgia Institute of Technology

2016 **Biomechanics Booth Host,** Mid-America Council Jubilee, Boy Scouts of America, Mahoney State Park, Ashland, NE

2016 **Biomechanics Booth Host,** UNO Lights On Event, Sapp Fieldhouse, University of Nebraska at Omaha

2016 **Biomechanics Instructor,** Girls, Inc. Summer Camp, Biomechanics Research Building, University of Nebraska at Omaha

2016 **Biomechanics Booth Host,** Nebraska Science Festival, Strategic Air Command and Aerospace Museum, Ashland, NE

2016 **Biomechanics Instructor,** National Biomechanics Day, Omaha North High Magnet School, Omaha, NE

2015 **Biomechanics Booth Host,** UNO Lights On Event, Sapp Fieldhouse, University of Nebraska at Omaha

2014 **Neuroscience Instructor,** NeuroWow Summer Event, University of Nebraska at Omaha

2012 – 2013 **Enrichment and Husbandry Assistant**, Callitrichid Research Center, University of Nebraska at Omaha

2012 **Undergraduate Assistant** –Magic of Chemistry Event, Durham Science Center, University of Nebraska at Omaha

SKILLS

Motion Analysis

Calibration of force plates & infrared cameras
Collection/processing using Cortex and Vicon
Development of custom Visual3D scripts
Composition of Matlab code for data analysis
Troubleshooting issues in data processing
Calculation of joint angles, moments, & powers
Evaluation of movement via nonlinear analyses

Biomechanics Research

Implementation of indirect calorimetry during walking
Construction/adaptation of varied terrain treadmill
Instruction of motion analysis skills to various students
Analysis & ideation of research questions & protocols
Collaboration with local Institutional Review Board
Interaction with diverse subject populations
Creation & participation in student-led journal club