MEGAN KAMACHI

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EDUCATION

Master of Applied Science – Biomedical / Mechanical Engineering 2017 - 2019
University of Toronto / Toronto Rehab Institute – Research supervised by Dr. Tilak Dutta
Thesis: Training Caregivers to Reduce Spine Flexion Using Biofeedback
- Research on the design, development and implementation of a wearable device to monitor low-back postures

Bachelor of Engineering, Biomedical / Mechanical (Co-op) – with a certificate in Business 2012 - 2017
University of Guelph – graduated with 86% cumulative average

TECHNICAL SKILLS

Electro-Mechanical Prototyping, SolidWorks (CSWP), Product Development, Arduino, MATLAB, Python, R, Research Methods in Human Factors and Ergonomics, Electrical Circuit Design

RESEARCH AND WORK EXPERIENCE

Technical Research Assistant (including and continuing my master's research) 2017 - present
Toronto Rehab Institute
- Prototyped a low-cost wearable device, PostureCoach Lite with mechanical components designed in SolidWorks to monitor low-back posture and integrated a prototyping PCB to notify the user when at risk of injury
- Currently iterating through the design process to implement user feedback on the advanced version of PostureCoach that uses IMU sensors wireless technology to upgrade the user experience
- Determined the long-term effectiveness of biofeedback on retention of safe lifting postures during caregiving activities by collecting postural data from 20 participants during four sessions involving simulated care tasks; the data was processed using MATLAB and statistically analyzed in R and JASP

Summer Research Assistant Toronto, ON 2017
Toronto Rehab Institute
- Used SolidWorks to design a data collection device to measure foot clearance (minimum height a person's foot clears the ground in swing phase while walking) on outdoor walkways; parts were machined in-house
- Collected data with the foot clearance measurement device in a pilot study to compare data with 3D motion capture data to validate measurement, which will be used to inform future walkway maintenance guidelines

Biomechanics Research Assistant Guelph, ON 2016
University of Guelph – School of Engineering
- Assisted in the design and validation of a smart wrist brace to assess and prevent carpal tunnel syndrome - gained hands-on experience with force sensitive resistors, a Parallax microprocessor, EMG sensors, Vicon Motion Capture and MATLAB
- Created a fatigue protocol to be used in the carpal tunnel prevention wrist brace evaluation by conducting a thorough literature review, collecting pilot data and testing assessment methods

SolidWorks Applications Specialist Etobicoke, ON 2015
CAD MicroSolutions Inc.
- Provided first-class customer service to a broad spectrum of engineering designers seeking technical support for 3D modeling software - managed all incoming calls/emails and gained ability to solve 12 tickets per day
- Completed SolidWorks Associate and SolidWorks Professional Certification
- Effectively presented technical team updates at weekly company-wide meetings because of high awareness of on-going customer transactions, co-worker status, training calendar updates and equipment

Teaching Assistant Toronto, ON 2017 - 2018
University of Toronto – Mathematics Department (MAT186 and MAT231)

- Led tutorial sessions of 35 first-year engineering students in Calculus for Engineers I and II, and 40 second-year industrial engineering students in Differential and Difference Equations course; facilitated group learning, marked weekly quizzes and projects; received positive feedback from students and professor

VOLUNTEER EXPERIENCE

Women's Team Captain Toronto, ON 2018 - 2019
University of Toronto – Varsity Blues Varsity Rowing Team

- Worked closely with coaching staff to foster a constructive, supportive, and familial team environment
- Coordinated and facilitated weekly team meetings to communicate updates, expectations and other information regarding events, regattas, and team on-goings

Director of Social Media Toronto, ON 2017 - 2019
University of Toronto – Biomedical Engineering Student Association

- Effectively managed social media accounts – Instagram, Twitter, Facebook – by regularly posting pictures and videos to publicize student achievements, community involvement and upcoming events

Engineering Peer Helper Guelph, ON 2013 - 2017
University of Guelph

- Established a new Facilitated Engineering Problem Solving program for Engineering Systems Analysis for second year students and initiated the development of a workshop series to support UoG engineers by providing the opportunity to build personal and technical skills
- Facilitated group problem solving sessions (8-10 students) to ensure fundamental concept knowledge and understanding of Engineering Mechanics material

RECOGNITION FOR EXCELLENCE

- One of three students in Canada to receive the AGE-WELL Master's Student Award in Technology and Aging for my innovative design of the PostureCoach Lite device and research on back-injury prevention (2018)
- People's Choice Award recipient at Toronto Rehab Institute Research Day for my oral presentation on PostureCoach and its benefits to a non-technical audience (2019)
- Awarded the College of Physical & Engineering Sciences Leadership Scholarship for my significant contributions to enhancing and promoting engineering through volunteer, leadership, and community involvement (2016)
- Graduated from the University of Guelph with distinction – five years on Dean's Honour Roll (2017)
- Recipient of the College of Physical & Engineering Sciences Dean's Scholarship awarded to students who have accomplished outstanding academic achievement (2015)

PROJECTS

EZ TOILET ASSIST – A biomechanical assistive device to help older adults with the sit-to-stand movement

SPLINT X – A post-operative flexor tendon rehabilitation device to reduce risk of scar tissue buildup or re-rupture

JOYRIDE – A joystick-controlled toy for mobility-disabled children with Bluetooth technology

PUBLICATIONS

Kamachi M., Owlia M., Dutta T. [In Progress] Training Caregivers to Use Safer Patterns of Movement with PostureCoach (a wearable device). Applied Ergonomics.

Kamachi M., Owlia M., Dutta T. (2020) Training Caregivers to Reduce Spine Flexion Using Biofeedback. In: Karwowski W., Ahram T., Nazir S. (eds) Advances in Human Factors in Training, Education, and Learning Sciences. AHFE 2019. Advances in Intelligent Systems and Computing, vol 963. Springer, Cham