

Aaron Yurkewich

Toronto Rehabilitation Institute, Ontario, Canada

Tel: (226) 927-2206, Email: aaron.yurkewich@gmail.com

Website: <http://www.iatsl.org/people/ayurkewich.html>

EDUCATION & TRAINING

PhD in Engineering Science Candidate, University of Toronto 2015-2019

Institute of Biomechanical & Biomaterials Engineering

- Design, Control & Clinical Validation of Robotic Systems for Rehabilitation of Stroke Patients in their Home, in Collaboration with the AGE-WELL NCE

Master's in Engineering Science, University of Western Ontario 2013-2015

Department of Electrical & Computer Engineering

- Aaron Yurkewich, "Design and Control of Robotic Systems for Lower Limb Stroke Rehabilitation." Electronic Thesis and Dissertation Repository, University of Western Ontario, M.E.Sc. Thesis, August 2015.

Bachelor's of Engineering Science, University of Western Ontario 2009-2013

Department of Mechanical & Materials Engineering

- Bachelor's of Engineering Science, With Distinction, 3.86 Cumulative GPA
- Gold Medal Recipient, Highest Overall Academic Average

WORK EXPERIENCE

Teaching Assistant, University of Western Ontario 2013-2015

- Instructed tutorials and labs for Intro to Digital Signal Processing (ECE 3331B)
- Instructed labs for Intro to Electrical Instrumentation (MSE 2201A), 2 years

Researcher, Canadian Surgical Technologies & Advanced Robotics 2011-2013

- Designed master-slave robotic devices for catheterized cardiac ablation, lung tumor resection, and upper and lower limb rehabilitation

RESEARCH, PUBLICATIONS, SCHOLARLY ACTIVITIES

Powered Orthoses for Upper Extremity Stroke Rehabilitation, PhD Student 2015-2019

- Used a user-centred inclusive design process to develop and controlled a powered finger and thumb orthosis for daily in-home assistance and rehabilitation
- Assessed and further developed upper extremity shoulder, elbow, and wrist rehabilitation robots for daily in-home rehabilitation

Aaron Yurkewich, Patrick Weiss, Rosalie Wang, Bing Ye, Debbie Hebert, Alex Mihailidis. Portable Wrist Pronation & Supination Robot for Stroke Rehabilitation. Presented at TRI Research Day, October 2015. Awarded Best PhD Poster.

Aaron Yurkewich, Rushmita Alam, Anita Stern, Ronald Baecker. Text, Talk, Photo, Video: What Communication Features do Older Adults with Mild Cognitive Impairment Use? A Pilot Trial with the InTouch Application. Canadian Association on Gerontology. Submitted April 2016.

Aaron Yurkewich, Anita Stern, Ronald Baecker, Frank Rudzicz. Amy Hwang. Communication Technology for Older Adults in Socially Isolating Environments. Canadian Association on Gerontology Symposium Application and Chair. Submitted April 2016.

Mobile Robots for Lower Extremity Stroke Rehabilitation, Master's Student 2013-2015

- Designed, manufactured and controlled a six-degree-of-freedom sensing and actuation system for in-home stroke rehabilitation
- Designed, manufactured and programmed the commercial version of the previously developed robotic system and generated a graphical user interface

Aaron Yurkewich, S. Farokh Atashzar, Ahmed Ayad, Dr. Rajni Patel. A Six-Degree-of-Freedom Robotic System for Lower Extremity Rehabilitation. IEEE International Conference on Rehabilitation Robotics (ICORR). Singapore. Accepted May 2015. Presented August 2015.

Concentric Tube Robots for Lung and Brain Surgery, Master's Student 2013-2015

- Modelled, designed, manufactured and assessed an embedded force and shape sensing system for surgical concentric tube robots using FBGs
- Evaluated OCT visualization *in vivo* for imaging lung and esophageal tumors

Ran Xu, Aaron Yurkewich, Dr. Rajni Patel. Curvature, Torsion and Force Sensing in Continuum Robots Using FBG Sensors. Journal of IEEE Robotics and Automation Society Letters (RA-L). Accepted January 2016. Published February 2016. Presented at IEEE International Conference on Robotics & Automation (ICRA) May 2016.

Ran Xu, Aaron Yurkewich, Dr. Rajni Patel. Curvature and Torsion Sensing for Pre-Curved Continuum Robots. SPIE BIOS. Accepted August, 2015. Presented February 2016.

Kaspar Shazada, Aaron Yurkewich, Ran Xu, Dr. Rajni Patel. Sensorization of a Surgical Robotic Instrument for Force Sensing. SPIE BIOS. Submitted August 3, 2015. Presented February 2016.

R. Xu, A. Yurkewich, C. Ward, A. Escoto, R. V. Patel, " Design of a Sensorized Concentric-Tube Robot ", Hamlyn Symposium on Medical Robotics, Submitted April 2016.

Ran Xu, Aaron Yurkewich, Dr. Rajni Patel. A Review of Modeling and Control of Concentric-tube Robots. Journal of Engineering. Submitted March, 2015.

Daniel Yurkewich, Abe Escoto, Dr. Ana-Luisa Trejos, Dr. Marie LeBel, Dr. Rajni Patel, R. V., Dr. Micheal Naish, (Aaron Yurkewich Acknowledged). Low-cost force-sensing arthroscopic tool using threaded fiber Bragg grating sensors. IEEE Biomedical Robotics and Biomechatronics. (2014).

Catheter Robots for Cardiac Surgery, NSERC USRA Undergraduate Student 2011-2015

- Led monthly meetings with a team of surgeons, professors, and research assistants to develop new ideas for cardiac interventions and surgical devices
- Designed, manufactured and programmed an optical strain sensor and catheter manipulator to measuring and control the force at the catheter tip
- Designed and implemented a control system to maintain prescribed forces on cardiac tissue during ablation procedures to control the burn depth
- Performed *in vivo* validation of clinical trial stage tools for mitral valve repair surgery and created initial designs for a catheter-based cardiac stitching tool

Mahta Khoshnam, Aaron Yurkewich, Dr. Rajni Patel. *Model-Based Force Control of a Steerable Ablation Catheter with a Custom-Designed Strain Sensor*. IEEE International Conference on Robotics and Automation. Karlsruhe, Germany. May 6, 2013. Accepted Jan. 7, 2013. Presented May 9, 2013.

GRANTS, AWARDS, HONOURS, ACCOLADES

Canada Foundation for Innovation (CFI) grant, Human-Centered Health-Care Robotics (submitted)	2016
AGE-WELL NCE Graduate Student Award in Technology & Aging	2015-2017
AGE-WELL Travel Award	2016
AGE-WELL NCE, Workpackage 5.3 Proposal	2015
Faculty of Engineering Award, IBBME	2015-2016
NSERC Canadian Graduate Scholarship (CGS-M)	2014, 2015
Ontario Graduate Scholarship, Ontario Student Assistance Program	2013, 2014(declined)
Computer-Assisted Medical Interventions NSERC CREATE Grant	2013-2015
John K. Foreman Gold Medal in Mechanical Engineering	2013
American Society of Heating, Refrigerating and Air-Conditioning	2013
NSERC Undergraduate Student Research Award (USRA)	2012
DELSCAN Corporation Scholarship in Engineering Science	2012
Lynn Fordham Award in Science and Engineering	2012
Ontario Professional Engineers Foundation Scholarship	2012
Craig O'Hagan Memorial Award	2011
Western University Dean's Honor List	2010-2013

CERTIFICATES, LICENCES, SPECIAL MEMBERSHIPS

AGE-WELL Highly Qualified Personnel, Canadian Partnership in Stroke Recovery (CPSR) Trainee, Canadian Association on Gerontology Trainee	2015-Present
IEEE Student Member	2013-Present
SolidWorks Associate Certification	2010

Invited Presentations/Lectures/Keynotes

"Upper Extremity Robots for Stroke Rehabilitation". Canadian Partnership for Stroke Recovery, Trainee Seminar Series. Sunnybrook Hospital, Toronto	2016
"Robotics in Stroke Rehabilitation". ECE Graduate Symposium. University of Western Ontario, London.	2015
"Rehabilitation Robotics". NSERC CREATE Computer Aided Medical Interventions (CAMI) Seminar. University of Western Ontario, London.	2015

EXTRA-CURRICULAR ACTIVITIES

Vice President, AGE-WELL Highly Qualified Personnel (HQP) Advisory Committee
 University Affairs Representative, IBBME Student Council, University of Toronto
 Recreational Therapy Volunteer, Geriatric Psychiatry, Toronto Rehab Institute
 Graduate Representative, Engineering Faculty Council, University of Toronto
 Reviewer, American Society of Mechanical Engineers (ASME)
 Collaborative Undergraduate-Graduate Research Facilitator, University of Toronto
 FIRST Robotics Mentorship Team Vice President, University of Western Ontario
 Robotics Club Mentor & Member, University of Western Ontario
 Charity Commissioner, Undergraduate Engineering Society Student Council
 Tutorial Developer for Training Engineering Skills, University of Western Ontario