Ryan William Chu, M.H.Sc.

661 Carlton Road, Markham, ON, L3P 7S4
ryanchu00@gmail.com | (647) 533-8580
Personal website: https://ryanwchu.com/

SUMMARY OF QUALIFICATIONS

❖ Five years of experience in medical technology and health care software development.
❖ Working proficiency in Python, C#, C++, Android AOSP, Java, MATLAB, SQL, and Bash.
❖ Experienced in use of computer vision and deep learning for classification, segmentation, and feature recognition.
❖ Working knowledge of optical techniques (e.g., photoplethysmography, depth sensing, fluorescent imaging) for recording physiological signals.
❖ Experienced in following regulatory standards in a quality management system (QMS) in accordance with ISO 13485 for medical devices.

SKILL HIGHLIGHTS

❖ Python	❖ Computer vision	❖ Optical techniques
❖ C++	❖ Signal processing	❖ Vital signs
❖ C#	❖ Deep learning	❖ VCS (Git, SVN, etc.)
❖ Android AOSP	❖ TensorFlow and Keras	❖ DICOM / PACS
❖ MATLAB	❖ Fluorescent imaging	❖ Academic writing
❖ Java	❖ Depth sensing	❖ Mentoring
❖ SQL	❖ Virtual reality	❖ Presentations

EXPERIENCE

Software Engineer EIT, SBI ALApharma Canada   June 2022 – Present
Toronto, ON
o Developed key software features for a handheld fluorescent camera using Android AOSP.
o Designed and administrated an electronic case report form (eCRF) and data collection platform for surgical media collected during a Phase III clinical trial.
o Designed and implemented clinician-facing tools in Python for handling fluorescent camera images.
o Explored opportunities for AI and computer vision to enhance clinician image interpretation using margin visualization.

Graduate Student, Biophotonics Lab, University of Toronto   Aug 2018 – Feb 2021
Toronto, ON
o Supervised by Dr. Ofer Levi and Dr. Alex Mihailidis.
o Designed and assembled a multi-camera system for remote monitoring of vital signs (heart rate, respiratory rate) based on light intensity and depth imaging.
o Refined computer vision and signal processing algorithms to optimize signal quality and compensate for subject motion.
o Evaluated vital sign accuracy in human participants and achieved clinical-level accuracy when compared to a gold standard bedside monitor.

Medical Physics Student, Princess Margaret Cancer Centre   May 2019 – Sep 2019
Toronto, ON
o Performed image registration between CT and MR images for over 200 patient datasets.
o Developed Python scripts for automatic registration, contouring, and resampling of CT/MR paired image sets in RayStation.
o Defined long-term project goals based on communication with radiation physicists at the hospital.

EDUCATION

Master of Health Science, Clinical Engineering   Aug 2018 – Nov 2020
University of Toronto, Toronto, ON
- o   Supervised by Dr. Ofer Levi and Dr. Alex Mihailidis.
- o   Thesis available on the University repository: https://hdl.handle.net/1807/126949
- o   Relevant courses: Bioengineering Science; Clinical Engineering Instrumentation; Advanced Topics in Magnetic Resonance Imaging; Tissue Injury, Repair, and Regeneration.

Bachelor of Applied Science, Electrical Engineering   Sep 2013 – Jun 2018
University of Waterloo, Waterloo, ON
- o   Graduate of the Honours Electrical Engineering Co-op program.
- o   Completed 5 co-op work terms with 3 "Outstanding" performance scores.
- o   Recipient of the Dean's List award in 2014 for exceptional academic performance.
- o   Relevant courses: Digital Signal and Image Processing, Adaptive Algorithms, Radio Frequency and Microwave Circuits, Organic Chemistry (I and II).

PATENTS AND INVENTIONS

O. Levi, E. Y. Zhu, D. A. Ringuette, **R. Chu**, "Remote portable vital signs monitoring" *US patent no. 11,850,026; Issued Dec 26, 2023.*

PUBLICATIONS

R. Chu, L. Kuramoto, D. Ringuette, E. Y. Zhu, and O. Levi, "Correlation of Near-Infrared Intensity and Depth Channels for Remote Vital Signs Monitoring ", SPIE Photonics West 2021 conference, paper 11651-16, San Francisco, CA (6-11 March 2021) (oral)

R. Chu, D. Ringuette, E. Y. Zhu, A. Mihailidis and O. Levi, "Motion-Tolerant Remote Respiration Monitoring with a Multi-Camera Configuration", Imaging Systems and Applications (IS) conference, OSA Technical Digest (CD), paper 3395473, Vancouver, BC, (June 24, 2020), (oral)

R. Chu, M. Downing, A. Srivastava, J. Cafazzo, A. Mihailidis and O. Levi, "Remote Acquisition of Vital Signs Using Infrared and Depth-Enabled Cameras", International Neuro-rehab symposium (NIRS 2019), Toronto, CANADA, paper INRS93 (June 24, 2019) (poster).

R. Chu, "A Double-Edged Sword: Advancements and Complications of Machine Learning in Healthcare", Clinical Engineering Society of Ontario (CESO) conference, Toronto, CANADA, (February 5, 2019), (oral). Available at: https://www.ceso.on.ca/ceso-2019-conference.html

LICENSES & CERTIFICATIONS

DeepLearning.AI TensorFlow Developer Specialization, Coursera   Feb 2022

HONOURS & AWARDS

Harold E. Johns Studentship in Medical Physics, Princess Margaret Cancer Centre   May 2019
3rd Place – Three Minute Thesis (3MT) Competition, University of Toronto   Apr 2019
Dean's Honours List, University of Waterloo   Jul 2014