MARAM SAKR

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Citizenship: Canadian

RESEARCH INTERESTS

I am an experimental roboticist working at the intersection of robotics, machine learning, and human-robot interaction. In particular, I focus on enabling everyday users to intuitively and efficiently program robots. My research investigates the challenges faced by potential users of programmable robots and develops interaction mechanisms, learning algorithms, and interfaces to enhance the efficiency and effectiveness of human-robot interaction.

EDUCATION

University of British Columbia — Vancouver, Canada
Monash University — Melbourne, Australia
Joint Ph.D., in Mechanical, Electrical and Computer Engineering — Fall 2017 – Summer 2025
Advisors: Prof. Machiel Van der Loos, Prof. Dana Kulić and Prof. Elizabeth Croft.
Cumulative GPA: 4.33

Johns Hopkins University — Baltimore, MD, USA
Visiting Graduate Scholar, in Computer Science Department — 2022
Advisor: Prof. Chien-Ming Haung

Simon Fraser University — Burnaby, Canada
M.Sc., in Engineering Science — Fall 2016 – Fall 2017
Thesis: Feasibility of Using Force Myography for Estimating Hand Force and Wrist Torque
Advisor: Prof. Carlo Menon
Cumulative GPA: 4.08

Mansoura University — Mansoura, Egypt
B.Sc., in Computers and Systems Engineering — 2007 - 2012
Distinction with honor degree, *Total grade:* 88.48% - ranked 3^{rd}
Thesis/Graduation Project: One-Eyed Self-Learning Arm Robot

ACADEMIC HONORS & AWARDS

- NSERC Postdoctoral Fellowship ($140,000 CAD), ranked first in Canada in the Computing Sciences committee. 2026 - 2028
- RSS Pioneer: I was selected to participate in the Robotics: Science and Systems (RSS) Pioneers Workshop, a highly selective workshop, bringing together a cohort of the world's top early career researchers in robotics. 2023
- Nominee for NSERC and L'Oréal-UNESCO for Women in Science award. 2023
- Canada Graduate Scholarships - Michael Smith Foreign Study Supplements (CGS-MSFSS) from NSERC ($6,000 for six months). 2022
- Alexander Graham Bell Canada Graduate Scholarship from NSERC ($35,000 per year for three years), ranked first in Canada in the Computing Sciences committee. 2020 - 2023
- President's Academic Excellence Initiative PhD Award at the University of British Columbia. 2020 - 2023

- HRI Pioneer: I was selected to participate in the Human-Robot Interaction (HRI) Pioneers Workshop, a highly selective workshop seeking to foster creativity, communication, and collaboration across Human-Robot Interaction. 2021
- British Columbia Government Scholarship (BCGS) ($15,000). 2020
- Monash Research Scholarship ($25,295). 2019 - 2023
- Monash International Postgraduate Research Scholarship ($42,340). 2019 - 2023
- The Faculty of Applied Science Graduate Award at the University of British Columbia, three times. 2018-2021
- The International Tuition Award at the University of British Columbia, two times. 2017 - 2019
- The Provost Doctoral Entrance Award for Women at the University of Waterloo ($5,000) (declined). 2017
- The Graduate Fellowship at Simon Fraser University ($6,500). Summer 2017
- My graduation project was one of the winning projects in the 6^{th} Annual Egypt's Young Entrepreneurs Competition of Injaz Egypt and we received a seed fund of 60,000 Egyptian pounds from ExxonMobil Egypt. 2012
- My graduation project won the Young Innovator award from Nahdet El Mahrousa Association and a prize of 6000 Egyptian Pounds, which is given to the best bachelor theses in Egypt. 2012
- Distinction Award from the Faculty of Engineering, Mansoura University, Egypt, five times. 2007 - 2012

WORK/RESEARCH EXPERIENCE

University of British Columbia Vancouver, Canada
Mechanical Engineering *Fall 2017 - Aug. 2025*

Research Assistant
Working with Prof. Machiel Van der Loos at the Collaborative Advanced Robotics and Intelligent Systems lab (CARIS) at the University of British Columbia, Prof. Elizabeth Croft at the University of Victoria, and Prof. Dana Kulić at Monash University. Conducting research in the area of Human-Robot Interaction and Robot Learning from Demonstration.

Johns Hopkins University Baltimore, MD, USA
Computer Science Department *January 2022 - June 2022*

Visiting Graduate Scholar
Working with Prof. Chien-Ming Huang at Intuitive Computing Lab. Conducting research in the area of Robot Learning from Demonstration.

Simon Fraser University Burnaby, Canada
School of Engineering Science *Fall 2015 - Fall 2017*

Research Assistant
Working with Prof. Carlo Menon at Menrva lab. Conducting research in the area of Human-Robot Interaction, Bio-Signals Processing and Machine Learning.

Simon Fraser University Burnaby, Canada
School of Computing Science *Spring 2015 - Fall 2015*

Research Assistant
Working with Prof. Mohamed Hefeeda at the Network Systems Lab. Conducting research in the area of Automation and Control systems, and Cloud Computing.

EduTKs (Educational Toys and Kits) Mansoura, Egypt
Co-founder *2013 - 2015*

Startup that specializes in designing and manufacturing creative educational toys and electronic kits for students.

TECHNICAL SKILLS

Operating Systems: Linux, Windows, macOS

Programming: Python, C++, C#, Matlab/Simulink, ROS (ROS Control, Rviz, Gazebo, MoveIt!)

Hardware: PR2, KUKA iiwa, UR5, Barrett WAM, da Vinci Surgical robot, Kinova Gen2, Kinova Gen3, Robotiq grippers, Microsoft HoloLens 1, Microsoft Hololens 2

Word processing: LaTeX, Microsoft Office, iWork

SELECTED PUBLICATIONS

Full list Google Scholar

JOURNAL ARTICLES

- **Maram Sakr**, Juyan Zhang, H.F. Machiel Van der Loos, Dana Kulić, and Elizabeth Croft. *"Consistency Matters: Defining Demonstration Data Quality Metrics in Robot Learning from Demonstration."* Accepted at the ACM Transactions on Human-Robot Interaction (THRI), 2025.
- **Maram Sakr**, Logan Zhang, Benjamin Li, Haomiao Zhang, H.F. Machiel Van der Loos, Dana Kulić, and Elizabeth Croft. *"How Can Everyday Users Teach Robots Efficiently from Demonstrations?"* Accepted at the ACM Transactions on Human-Robot Interaction (THRI), 2025.
- **Maram Sakr**, Zexi Jesse Li, H.F. Machiel Van der Loos, Dana Kulić, and Elizabeth Croft.*"Quantifying Demonstration Quality for Robot Learning and Generalization"*, IEEE Robotics and Automation Letters, 7(4), pp.9659-9666, 2022 [Also presented at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, October 2022].
- Wesley P. Chan, Geoffrey Hanks, **Maram Sakr**, Tiger Zuo, H.F. Machiel Van der Loos, and Elizabeth Croft. *"Design and Evaluation of a Wearable Augmented Reality Interface for Human-Robot Teams Collaborating in Physically Shared Manufacturing Tasks"*, ACM Transactions on Human-Robot Interaction (THRI), 11(3), pp.1-19, 2022.
- Jonathan F. Lin, Pamela Carreno-Medrano, Mahsa Parsapour, **Maram Sakr** and Dana Kulić.*"Objective learning from human demonstrations"*, Annual Reviews in Control, 2021.
- **Maram Sakr**, Xianta Jiang, and Carlo Menon. *"Estimation of User-applied Isometric Force/Torque using Upper Extremity Force Myography"*, Frontiers in Robotics and AI, 6(120), 2019.
- Alaa Eldin Abdelaal, **Maram Sakr**, Apeksha Avinash, Shahed Khan Mohammed, Armaan Kaur Bajwa, Mohakta Sahni, Soheil Hor, Sidney Fels, Septimiu E. Salcudean. *"Play Me Back: A Unified Training Platform for Robotic and Laparoscopic Surgery"*, IEEE Robotics and Automation Letters, 4(2), pp.554-561, 2018. [Also presented at the IEEE International Conference on Robotics and Automation (ICRA), Montreal, QC, Canada, May 2019].

PEER-REVIEWED CONFERENCE PUBLICATIONS

- Rajat Kumar Jenamani, Priya Sundaresan, **Maram Sakr**, Tapomayukh Bhattacharjee, Dorsa Sadigh. *"FLAIR: Feeding via Long-Horizon AcquIsition of Realistic dishes"*, The Robotics: Science and Systems conference, 2024.

- Calvin Z. Qiao, **Maram Sakr**, Katharina Muelling, and Henny Admoni. *"Learning from Demonstration for Real-Time User Goal Prediction and Shared Assistive Control"*, IEEE International Conference on Robotics and Automation (ICRA), 2021.
- **Maram Sakr**, Martin Freeman, H.F. Machiel Van der Loos, Elizabeth Croft. *"Training Human Teacher to Improve Robot Learning from Demonstration: A Pilot Study on Kinesthetic Teaching"*, IEEE International Conference on Robot and Human Interactive Communication (RO-MAN), 2020.
- Wesley P. Chan, Geoffrey Hanks, **Maram Sakr**, Tiger Zuo, H.F. Machiel Van der Loos, and Elizabeth Croft. *"An Augmented Reality Human-Robot Physical Collaboration Interface Design for Shared, Large-Scale, Labour-Intensive Manufacturing Tasks"*, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pp. 11308-11313.
- **Maram Sakr**, and Carlo Menon. *"Exploratory Evaluation of the Force Myography (FMG) Signals Usage for Admittance Control of a Linear Actuator"*, IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob), 2018.
- **Maram Sakr**, and Carlo Menon. *"On the estimation of isometric wrist/forearm torque about three axes using Force Myography"*, IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob), 2017.
- **Maram Sakr** and Carlo Menon. *"Study on the Force Myography Sensors Placement for Robust Hand Force Estimation"*, IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2017.

PEER-REVIEWED WORKSHOP PUBLICATIONS

- **Maram Sakr**. *"Towards an Efficient Teaching by Demonstration Framework for Robot Learning"*, Companion of the Robotics: Science and Systems (RSS), RSS Pioneers workshop, July 2023. (**Acceptance rate:** $\sim$ 22%)
- **Maram Sakr**, H.F. Machiel Van der Loos, Dana Kulić and Elizabeth Croft. *"What Makes a Good Demonstration for Robot Learning Generalization?"*, Companion of the ACM/IEEE International Conference on Human-Robot Interaction (HRI), HRI Pioneers Workshop, March 2021. (**Acceptance rate:** $\sim$ 24%)

THESES

- **Maram Sakr**, *"Feasibility of Using Force Myography for Estimating Hand Force and Wrist Torque"*. M.Sc. Thesis, School of Engineering Science, Faculty of Applied Sciences, Simon Fraser University, Burnaby, BC, Canada. October 2017.
- **Maram Sakr** et. al. *One-Eyed Self-Learning Arm Robot.* B.Sc. Thesis, Computers and Systems Engineering Department, Faculty of Engineering, Mansoura University, Mansoura, Egypt. June 2012.

BOOKS

- Leimin Tian, Tina LY Wu, Nicole L Robinson, Pamela Carreno-Medrano, Wesley P Chan, **Maram Sakr**, Elahe Abdi, Elizabeth A Croft, and Dana Kulić, *"Experimental Methodology for Human-Robot Interaction: Guidelines and Case Studies for Human-Centred and Ethical Robotics Research"*. CRC Press, Taylor Francis Group, 2025.

TEACHING EXPERIENCE

Mansoura University Mansoura, Egypt
Computers and Systems Engineering Department *2012 - 2014*

Teaching Assistant
CSE 3413: Machine Learning
CSE 3116: Control Engineering

CSE 3215: Measurement Devices & Sensors
CSE 3221: Statistical Applications
CSE 3424: Elective course "Microprocessor"
UNC 144: Decision support system

MENTORSHIP

- Surafel Anshebo, MASc Student, Virginia Tech — Fall 2024 - Present
- Oluwanifemi Adekanye, Undergraduate Student, Bowen University, Nigeria — Fall 2024 - Present
- Taeyhang (Jennette) Lim, MASc. student at Hanyang University, South-Korea — Fall 2023 - Summer 2024
- Joo Sun Lee, PhD student at Hanyang University, South-Korea — Fall 2023 - Summer 2024
- Alexander Calvert, Undergraduate Student, Electrical and Computer Engineering, Monash University — Summer 2023 - Fall 2023
- Illya Danilevitch, Undergraduate Student, Mechanical Engineering, UBC — Summer 2023
- Qiwu (Angie) Zhang, Undergraduate Student, Electrical and Computer Engineering, UofT — Fall 2022 - Summer 2023
- Emmanuel Ochieng, Undergraduate Student, Cognitive Science, JHU — Fall 2022
- Raiaan Khan, Undergraduate Student, Mechanical Engineering, UBC — Summer 2022
- Priydev Singh, Undergraduate Student, Mechanical Engineering, UBC — Summer 2022
- Chloe Donelan, Undergraduate Student, Computer Science, JHU — Spring 2022
- Kyoungjin Lim, Undergraduate Student, Computer Science, JHU — Spring 2022
- Benji Li, Undergraduate Student, Mechanical Engineering, UBC — Summer 2021 - Spring 2022
- Delun Chan, MASc Student, Mechanical Engineering, UBC — Spring 2021 - Fall 2023
- Logan Zhang, Undergraduate Student, Mechanical Engineering, UBC — Fall 2020 - Summer 2022
- Haomiao Zhang, MASc Student, Mechanical Engineering, UBC — Spring 2020 - Summer 2024
- Megan Farn, Undergraduate Student, Mechanical Engineering, UBC — Summer 2021
- Nicholas Qu, Undergraduate Student, Mechanical Engineering, University of Waterloo — Fall 2020 - Spring 2021
- Jesse Li, Undergraduate Student, Mechanical Engineering, UBC — Summer 2020 - Summer 2021
- Sophie Lin, Undergraduate Student, Mechanical Engineering, UBC — Summer 2020 - Spring 2021
- Sameer Todkar, MEng, Mechanical Engineering, UBC — Fall 2020 - Spring 2021
- Yiyi Yan, Undergraduate Student, Mechanical Engineering, UBC — Spring 2020 - Summer 2020
- Martin Freeman, Undergraduate Student, Mechanical Engineering, UBC — Fall 2018 - Summer 2019
- Yi Jui Lee, MASc, Biomedical Engineering, UBC — Summer 2018 - Summer 2019
- Waleed Uddin, MEng, Mechanical Engineering, UBC — Summer 2018 - Spring 2019

SERVICE

- Program chair at the RSS Pioneers 2024.
- Reviewer at CREATE-U program at Mechanical Engineering, UBC. (Summer 2023)

- Panelist at RSS 2021 Workshop on Accessibility of Robot Programming and the Work of the Future
- Reviewer at:
  - ACM Transactions on Human-Robot Interaction (THRI)(2025)
  - The Robotics: Science and Systems (RSS)(2021, 2023, 2025)
  - IEEE Robotics and Automation Letters (2022, 2023, 2024, 2025)
  - IEEE International Conference on Robotics and Automation (ICRA 2024)
  - IEEE International Conference on Robot & Human Interactive Communication (RO-MAN)(2022, 2025)
  - IEEE/ASME Transactions on Mechatronics (2021, 2022, 2024)
  - Frontiers in Physiology Journal (2021)
  - The International Journal of Computers in Industry (2021)
  - IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)(2020, 2022)
  - ACM/IEEE International Conference on Human-Robot Interaction (HRI)(2020, 2021, 2022, 2023, and 2024)
  - IEEE Haptics Symposium (2020)
  - IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob 2018)
- Volunteer at the organization of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2017)
- Volunteer at the organization of ROSCon 2017 (the main conference for the developers of Robot Operating System (ROS))

INVITED TALKS

- *"Democratizing Robot Learning: Teaching by Demonstration with Everyday Users in Mind"* at University of California San Diego, Sept 2025.
- *"Democratizing Robot Learning: Teaching by Demonstration with Everyday Users in Mind"* at Stanford University, Sept 2025.
- *"Democratizing Robot Learning: Teaching by Demonstration with Everyday Users in Mind"* at the University of Montreal, May 2025.
- *"Robot Teaching and Learning with Everyday Users in Mind"* at the University of Illinois Chicago, February 2025.
- *"Improving Learning from Demonstrations by Improving Teaching"* at Stanford University, September 2023.
- *"Quantifying Demonstration Quality for Robot Learning and Generalization"* at Johns Hopkins University, March 2022.
- *"What Makes a Good Demonstration for Robot Learning Generalization?"* at the RSS 2021 Workshop on Accessibility of Robot Programming and the Work of the Future.

ADDITIONAL TRAINING

University of British Columbia Vancouver, Canada
The Instructional Skills Workshop (ISW)) *December 2021*

This workshop was a 4-day hands-on, intensive teaching course that combines an emphasis on learning evidence and theory-based approaches to teaching and learning.

Monash University Melbourne, Australia
The Robotic Vision Summer School (RVSS) *February 2021*

RVSS designed by the Australian Centre for Robotic Vision. It focuses on fundamental and advanced topics in computer vision and robotics. Through invited lectures, hands-on demonstrations, workshops and mini-projects, the purpose of this summer school is to help researchers familiarize themselves with cutting-edge research in this field.

IVADO and The University of Montreal Montreal, Canada
The 5^{th} Deep Learning Winter School *December 2019*

This winter school was a five-day hands-on, and intensive course in Deep Learning including the fundamental aspects, different applications and future trends.

Simon Fraser University Burnaby, Canada
The International Teaching Assistants Program *May 2015*

This program was 10-week intensive seminars and workshops that combines an emphasis on learning evidence and theory-based approaches to teaching and learning.

VOLUNTEERING AND OUTREACH

- Mentor at Fatimah Fellowship Program, a non-profit organization providing research opportunities, mentorship, and computational resources to students in developing countries. September 2024 – Present
- Member at the counselling team at Egypt Scholars Inc. where we provide mentorship to current and prospective students regarding studying abroad, hunting scholarships and admission requirements. June 2016 - Present
- Member of Quality and Reliability unit that aims to improve the education quality in Faculty of Engineering, Mansoura University, Egypt. 2013 - 2015
- Member of the scientific community in my department at Mansoura University. 2012 - 2015

REFERENCES

1. Prof. Elizabeth Croft — `ecroft@uvic.ca`
2. Prof. Dana Kulić — `dana.kulic@monash.edu`
3. Prof. H.F. Machiel Van der Loos — `vdl1@mail.ubc.ca`