Trishia El Chemaly

Email : tchemaly@stanford.edu

LinkedIn — Website — Stanford Profile

PhD candidate with experience in extended reality, computer vision, and neural engineering. Proven expertise in spearheading innovative projects, managing teams, mentoring, and rapidly adapting to new environments.

Education

Stanford University — CA, US
PhD in Bioengineering; GPA: 4.02/4.00 — *2019 - June 2025 (Expected)*

American University of Beirut (AUB) — Beirut, Lebanon
Master of Science in Biomedical Engineering; GPA: 95.04% — *2017 - 2019*

Holy Spirit University of Kaslik (USEK) — Kaslik, Lebanon
Bachelor of Engineering in Biomedical Engineering, high distinction; GPA: 95.34% — *2013 - 2017*

Research Experience

Stanford University — CA, US
Graduate Research Assistant — *Oct 2020 - Present*

- Stereoscopic calibration for augmented reality visualization in microscopic surgery
- Computer vision for improving the accuracy of tracking in augmented reality
- Interactive shape sonification for tumor localization in breast cancer surgery

Undergraduate Student Mentor — *June 2022 - Present*

- Tracking and augmented reality visualization of needles in ultrasound-guided gynecologic brachytherapy
- Automating surgical instrument tracking in mastoidectomy videos with YOLOv8
- Improving gaze stabilization exercises with virtual reality

Neural Engineering and Nanobiosensors Group, AUB — Beirut, Lebanon
Graduate Research Assistant — *Jan 2018 - Sep 2019*

- High resolution electrical stimulation of the retina
- Modeling the effect of ultrasound on neural excitability
- B-Type Natriuretic Peptide biosensing for point-of-care heart failure diagnostic platforms

Robotics and Mechatronics Laboratory, University of Twente — Enschede, the Netherlands
Student Researcher — *Oct 2016 - May 2017*

- Multimodality image registration for visualization in robotic assisted breast biopsy

CardioDiagnostics — Dbayeh, Lebanon
Research and Development Intern — *June 2016 - Aug 2016*

- Unsupervised machine learning and data mining of cardiac patient data sets

Publications

- **T. E. Chemaly**, C. A. Neves, F. Fu, B. Hargreaves, N. H. Blevins, From Microscope to Head-Mounted Display: Integrating Hand Tracking into Microsurgical Augmented Reality, Computer Assisted Radiology and Surgery 2024, (accepted).
- **T. E. Chemaly***, L. Schütz*, B. Daniel, C. Leuze, N. Navab, Interactive Shape Sonification for Tumor Localization in Breast Cancer Surgery, ACM Special Interest Group on Computer-Human Interaction (CHI), (accepted).
- C. A. Neves, G. S. Liu, **T. E. Chemaly**, I. A. Bernstein, F. Fu, N. H. Blevins, Automated Radiomic Analysis of Vestibular Schwannomas and Inner Ears Using Contrast-Enhanced T1-Weighted and T2-Weighted Magnetic Resonance Imaging Sequences and Artificial Intelligence, Otology & Neurotology 2023, pp. 10.1097.
- **T. E. Chemaly**, C. A. Neves, C. Leuze, B. Hargreaves, N. H. Blevins, Stereoscopic calibration for augmented reality visualization in microscopic surgery, International Journal of Computer Assisted Radiology and Surgery 2023, pp. 1-9.
- M. de Lotbiniere-Bassett, A. V. Batista, C. Lai, **T. E. Chemaly**, J. Dort, N. Blevins, J. Lui, The user experience design of a novel microscope within SurgiSim, a virtual reality surgical simulator, International Journal of Computer Assisted Radiology and Surgery 2022, pp. 1-9.

- **T. E. Chemaly***, H. Alawieh*, M. Khraiche, Towards Point-of-Care Heart Failure Diagnostic Platforms: BNP Biosensors, Sensors 2019, 19, 5003.
- R. E. Hassan, **T. E. Chemaly**, M. Khraiche, Towards a Biomechanical Model for Ultrasound Effect on Neural Excitability, 2018 IEEE International Multidisciplinary Conference on Engineering Technology (IMCET), Beirut, 2018, pp. 1-6.
- **T. E. Chemaly**, F. J. Siepel, S. Rihana, V. Groenhuis, F. van der Heijden and S. Stramigioli, MRI and stereo vision surface reconstruction and fusion, 2017 Fourth International Conference on Advances in Biomedical Engineering (ICABME), Beirut, 2017, pp. 1-4.

Teaching Experience

Stanford University CA, US

Teaching Assistant *Spring 2021, Fall 2021, Spring 2022*

- BIOE 80: Introduction to Bioengineering
- RAD206: Mixed-Reality in Medicine
- BIOE301C: Diagnostic Devices Lab

Awards and Honors

- **Best Use of Looking Glass,** MIT Reality Hack, Jan 2024
- **2nd Place for our project EduVision,** MIT Reality Hack Startup Track, Jan 2024
- **1st Place for our project Touchless Heartbeat,** Stanford XR Hackathon: Reimagining Reality, May 2022
- **The Eltoukhy Family Graduate Fellowship,** Stanford, 2019 - 2020
- **Best 3MT Research Presentation Award,** AUB, Apr 2019
- **3MT People's Choice Award,** AUB, Apr 2019
- **Robotics Design Award,** Massachusetts Qualifying Skyrise, VEXU Robotics Competition, Apr 2015
- **Merit Scholarship,** USEK, 2013 - 2017 (awarded for ranking first in the entire Engineering Department)
- **Excellence Scholarship,** USEK, 2012 - 2013

Leadership

Stanford XR CA, US

President *May 2023 - Present*

- Organized Immerse The Bay, Stanford University's first public XR Hackathon, making it the largest XR hackathon in the Bay Area and one of the 3 largest in the world with 319 competitors, 10 countries, and 82 universities
- Led a committed team of 23 to successfully execute Immerse The Bay
- Raised funds and equipment worth $50k+, marketed to 100+ universities worldwide, and organized the entire experience for 200+ in-person participants for 3 days
- Led efforts to make the hackathon beginner-friendly by providing mentors and organizing workshops, resulting in over 50% participation from first-time hackers and students who had never tried XR headsets before

Vice President and XR Mentor *Oct 2022 - May 2023*

- Co-founded and directed Stanford University's first XR incubator program
- Delivered talks and mentorship to students by collaborating with venture capitalists and industry professionals
- Co-organized the 2023 Stanford XR Annual Conference and led the medical XR panel
- Mentored 10+ teams to build and launch their products

USEK Robotics Team Kaslik, Lebanon

Team Leader *June 2016 - June 2017*

RobotC Programmer *Sep 2015 - June 2017*

Skills

- Virtual and augmented reality development (4+ years in Unity and C#, Swift)
- Computer vision and deep learning (Python, MATLAB, Unity and C#)
- Object-oriented programming (C#, Python, JavaScript)
- Robotics programming (C/C++, RobotC, ROS, Mathematica)
- Medical signal and image processing, computational modeling (Python, MATLAB)
- Experimental handling and electrical recording from neural tissue
- Analysis of neural recording (MATLAB, Offline Sorter, Spike 2)