ZEINAB ABBOUD

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EDUCATION

Ph.D. | **Computer Engineering** | **Polytechnique Montréal & Mila** **2021 - Present**

- **Research**: Uncertainty in deep learning (variational Bayes, sparse methods), distributional shifts, model robustness, confidence calibration, computer vision.

M.A.Sc. | **Engineering Physics** | **Polytechnique Montréal** **2016**

- **Thesis Title**: *in situ* Studies of Volatile Molecules Trapping in Zirconium Alloy-based Non-Evaporable Getter.
- ***Graduated with thesis excellence***

B.Sc.H. - Co-op | **Nanoscience [minors: physics and mathematics]** | **University of Guelph** **2014**

PROFESSIONAL EXPERIENCE

Responsible AI Program Manager | **AI 2030, USA** **2024 - Present**

- Leading the design and execution of the Responsible AI Leadership Program, focusing on fairness, accountability, and regulatory compliance.
- Coordinating with industry experts, academics, and policymakers to deliver impactful sessions.
- Managing participant engagement, logistics, and program outcomes to ensure success and alignment with AI 2030's mission.

Globalink Mentor | **Mitacs Inc., Canada** **2023 - 2024**

- Mentored and supported Globalink Research Interns (10+), facilitating orientation, providing weekly guidance, and ensuring smooth transitions at host universities.

Metrology Engineer II | **Illumina, USA** **2018 - 2020**

- Developed and integrated new automated image processing algorithms for production QC.
- Improved production process control and tool-to-tool precision from over 50% variability to less than 15%.
- Developed and implemented an image processing pipeline for cross-functional groups, from development to production.
- Led the full cycle of automation and integration of a new metrology technique to production within the framework of Software Lifecycle Management, from defining user requirements to reviewing and validating test cases and production release.

Metrology Scientist | **Teledyne DALSA Semiconductor, Canada** **2016 - 2018**

- Led the materials analysis, metrology, and characterization for ultra-thin films (PVD/CVD) for pellicle development for EUV Lithography with ASML.
- Characterized and optimized thin film surfaces and interfaces via XPS, AFM, SEM, and XRR techniques.
- Developed ellipsometry models for PVD and CVD films for in-line process monitoring with GageR&R below 10% for single and multi-layer ultra-thin films (<10 nm).
- Designed and executed DOEs for root cause analysis, identified a critical workflow problem, and implemented a major process change. This improved product performance and eliminated specific scrap recurrence, achieving zero defect recurrence related to the specific failure mode.
- Designed and executed DOEs for the development of process-product correlations.

RESEARCH EXPERIENCE

Doctorate Research Assistant | **Polytechnique Montréal, Canada** **2021 - Present**

- Research in deep learning model uncertainty and generalizability for computer vision applications.
- Sparsity in variational Bayes and deterministic neural networks for parameter-efficient solutions.
- Evaluation of risks of covariate shifts in real-world data and impact on model generalizability.

Research Assistant | San Diego State University, USA **2019**

- Researching hydrogen evolution reactions in metal-organic frameworks (MOFs). (1 article)

Masters Research Assistant | Polytechnique Montréal, Canada **2015 - 2016**

- Characterization of gas-solid interaction in nano-getter material for integrated non-evaporable getter in wafer-level packaged microbolometers developed by Teledyne DALSA Semiconductor. (1 journal article, 1 poster presentation, 1 invited talk, 2 conference talks)

Postgraduate Research Assistant | University of Guelph, Canada **2014**

- Fabricated composite fibers of Poly(lactic) acid and carbon nanomaterials and analyzed their morphology and mechanical properties. (2 journal articles, 3 poster presentations)

Undergraduate Research Assistant | FPInnovations, Canada **2013**

- Developed a flexible, printed, paper-based touch pad based on ink-jet printed capacitors and Arduino microcontrollers.

Undergraduate Research Assistant | University of Alberta, Canada **2013**

- Characterized modified natural fibers with atomic force microscopy and spectroscopy. (1 journal article, 1 poster presentation)

Undergraduate Research Assistant | University of Notre Dame, USA **2012**

- Synthesized organic semiconducting nanowires (P3HT) and crystals (PCBM) for light harvesting device applications. Characterized and analyzed the material's structure and optical properties.

Undergraduate Research Assistant | TRIUMF, Canada **2011**

- Designed a fast, high-voltage ion-beam deflector employing the Bradbury-Nielsen Gate for ion beam purification. (1 journal article)

AWARDS AND DISTINCTIONS

National

2020 - 2023	NSERC Postgraduate Scholarship-Doctoral (PGS-D) -*converted to CGS-D 2022-2023*
2015 - 2016	MITACS Graduate Student Scholarship
2013	NSERC Industrial Undergraduate Student Research Award
2013	University of Alberta Research Experience (UARE) Award

Provincial

2024 - 2027	FRQNT PhD Scholarship - *Ranked no.1 in Techniques, Measurements, & Systems committee*

Institutional

2017	Nominated for Best Thesis Award, Polytechnique Montréal
2013 - 2014	Dean's Honours List, University of Guelph
2014	Featured in University of Guelph's Co-op Success Stories: link
2013	Nominated for Co-op Student of the Year Award, University of Guelph.

Department

2016	Best Masters Thesis, Engineering Physics, Polytechnique Montréal.

Conference & Symposiums

2024	Travel & Registration Award to NeurIPS by Women in Machine Learning (WiML) Workshop, Vancouver, Canada.
2016	Best Poster Award at 10th NAMIS International Research Network, University of Tokyo, Japan.

Professional

2024	Awarded Program Manager of the Year, AI 2030
2020	Recognized for going above and beyond in leading software development, automation, and improvement of image analyses to production. Illumina, USA
2020	FoFee Award for Technical Excellence in driving software development and automation for NPI projects. Illumina, USA
2017	Nominated for Employee of the Year Award in Technology Innovation. Teledyne DALSA Semiconductor, Canada

PUBLICATIONS

Conference Proceedings

- **Abboud, Z.**, Lombaert, H., and Kadoury, S. Sparse Bayesian Networks: Efficient Uncertainty Quantification in Medical Image Analysis. (**2024**). 27th MICCAI Conference, Early Acceptance (11% of submissions).
- **Abboud, Z.** and Kadoury, S. Impact of train- and test-time Hounsfield unit window variation on CT segmentation of liver lesions. (**2023**). SPIE Medical Imaging.

Journal Articles

- Assali, S., Koelling, S., **Abboud, Z.**, . . . , Moutanabbir, O. (**2022**) 500-period epitaxial Ge/Si0.18Ge0.82 multi-quantum wells on silicon. Journal of Applied Physics 132, 175304.
- Yang, F., . . . , **Abboud, Z.**, . . . and Gu, J. (**2020**) Photo, Bio-Electrochemical Systems for Environmental Remediation and Energy Harvesting. ChemSusChem.
- **Abboud, Z.**, and Moutanabbir, O. (**2017**) Temperature-dependent in situ studies of volatile molecule trapping in low temperature-activated Zr alloy-based getters. J. Physical Chemistry C.
- **Abboud, Z.**, . . . and Mohanty, A. K. (**2016**). Leaf extract mediated biogenic process for the decoration of graphene with silver nanoparticles. Materials Letters, 178, 115-119.
- George, M., Mussone, P. G., **Abboud, Z.**, and Bressler, D. C. (**2014**). Characterization of chemically and enzymatically treated hemp fibres using atomic force microscopy and spectroscopy. Applied Surface Science, 314, 1019-1025.
- Teigelhoefer, A., Lassen, J., **Abboud, Z.**,. . . and Raeder, S. (**2013**). Yttrium ionization scheme development for Ti: Sa laser based RILIS. Hyperfine Interactions, 216(1-3), 65-70.

Thesis

- **Abboud, Z.** (**2016**). *In situ studies of volatile molecules trapping in zirconium alloy-based non-evaporable getter*. Ecole Polytechnique, Montréal (Canada).

Invited Talks

- **Abboud, Z.**, Chagnon, D., Fortin-Deschênes, M., Assali, S., Coia, C., Moutanabbir, O. (**2018**). Hermetic Wafer-Level Packaging of Microbolometers for Uncooled Thermal Cameras. The ElectroChemical Society (ECS): Americas International Meeting on Electrochemistry and Solid State Science (AiMES). Cancun, Mexico.
- **Abboud, Z.**. Materials Science in Modern MEMS: Challenges and Opportunities. (**2017**). Le Regroupement québécois étudiant sur les matériaux de pointe (RQEMP). Bishop's University, Sherbrooke, Canada.

TECHNICAL REVIEWER

IEEE	Transactions on Medical Imaging | 1 article	**2024**
MICCAI	Main conference | 4 papers	**2024**
ICML	Workshop on Advancing Neural Network Training (WANT) | 2 papers	**2024**
NeurIPS	Workshop on Women in Machine Learning (WiML) | 5 abstracts	**2024**
NeurIPS	Workshop on Advancing Neural Network Training (WANT) | 3 papers	**2023**