Shahira Abousamra https://shahiraabousamra.github.io/

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ABOUT

PhD student at the Department of Computer Science in Stony Brook University.
Advisors: Dr. Chao Chen and Dr. Dimitris Samaras. (*Previously advised by Dr. Roy Shilkrot until my 3rd year*)
My research spans computer vision, deep learning, topological data analysis, and biomedical image analysis.

EDUCATION

PhD in Computer Science – Stony Brook University, NY – GPA 4.0 **Sep 2016 – Expected Dec 2023**
Selected Courses: Advanced Computer Vision (CSE 615), Introduction to Computer Vision (CSE 527), Artificial Intelligence (CSE 537), Big Data Analytics (CSE 545), Analysis of Algorithms (CSE 548)

MSc in Computer Science – University of Alexandria, Egypt **Sep 2005 – Jan 2011**
Thesis: Enhancing Cache Performance via Adaptive Set-Based Partitioning

BSc in Computer Science – University of Alexandria, Egypt **Sep 2000 – Jun 2005**

SELECTED PUBLICATIONS AND AWARDS

Topology-Guided Multi-Class Cell Context Generation for Digital Pathology
S. Abousamra, R. Gupta, T. Kurc, D. Samaras, J. Saltz, C. Chen, CVPR 2023.

Unsupervised Stain Decomposition via Inversion Regulation for Multiplex Immunohistochemistry Images
S. Abousamra, D. Fassler, J. Yao, R. Gupta, T. Kurc, L. Escobar-Hoyos, D. Samaras, K. Shroyer, J. Saltz, C. Chen, MIDL 2023.

Multi-Class Cell Detection Using Spatial Context Representation
S. Abousamra, D. Belinsky, J. Arnam, F. Allard, E. Yee, R. Gupta, T. Kurc, D. Samaras, J. Saltz, C. Chen, *ICCV 2021* (**Oral**).

Localization in the Crowd with Topological Constraints
S. Abousamra, M. Hoai, D. Samaras, C. Chen, AAAI 2021.

Deep Learning-based Image Analysis Methods for Brightfield-acquired Multiplex Immunohistochemistry Images
D. Fassler*, S. Abousamra*, R. Gupta, C. Chen, M. Zhao, D. Paredes, S. Batool, B. Knudsen, L. Escobar-Hoyos, K. Shroyer, D. Samaras, T. Kurc, J. Saltz, *Diagnostic Pathology, 2020*.

Weakly-Supervised Deep Stain Decomposition For Multiplex IHC Images
S. Abousamra, D. Fassler, L. Hou, Y. Zhang, R. Gupta, T. Kurc, L. F. Escobar-Hoyos, D. Samaras, B. Knudson, K. Shroyer, J. Saltz, C. Chen, *ISBI 2020*.

Utilizing Automated Breast Cancer Detection to Identify Spatial Distributions of Tumor-infiltrating Lymphocytes in Invasive Breast Cancer
H. Le, R. Gupta, L. Hou, S. Abousamra, D. Fassler, L. Torre-Healy, R. Moffitt, T. Kurc, D. Samaras, R. Batiste, T. Zhao, A. Rao, A. Van Dyke, A. Sharma, E. Bremer, J. Almeida, J. Saltz, *The American journal of pathology, 2020*.

Deep Learning-Based Mapping of Tumor Infiltrating Lymphocytes in Whole Slide Images of 23 Types of Cancer
S. Abousamra, R. Gupta, L. Hou, R. Batiste, T. Zhao, A. Shankar, A. Rao, C. Chen, D. Samaras, T. Kurc, J. Saltz, *Frontiers in Oncology, 2022*.

Localization and Tracking in 4D Fluorescence Microscopy Imagery
S. Abousamra, S. Adar, N. Elia, R. Shilkrot; *CVPR Workshops, 2018*.

Best Presentation in Domain Award: **Localization in the Crowd with Topological Constraints**
S. Abousamra, M. Hoai, D. Samaras, C. Chen, *SBU Graduate Research Day, 2021*.

Best Poster Award: **Automating Lifecycle-Phase Identification in Microscopy Images of Zebrafish Embryos**
S. Abousamra, A. S. Aydin, R. Shilkrot, *Center of Excellence in Wireless and Information Technology Conference, 2017*.

Best Paper Award: **Fair and Adaptive Online Set-Based Cache Partitioning**
S. Abousamra, A. El-Mahdy, S. Selim, *ICCES 2011*.

Distinction with Honors: BSc. in Computer Science and Automatic Control – *Class Rank 7th* (Jun 2005).

WORK EXPERIENCE

- **Applied Scientist Intern – Amazon** **June 2022 – September 2022**

Project: Representation learning with language-vision models for biomedical data.

- **Applied Scientist Intern – Amazon** **June 2021 – September 2021**

Project: Clustering refinement from edge similarity features using graph neural networks.

- **Teaching Assistant – Stony Brook University, NY** **September 2016 – December 2018**

TA for courses CSE 592 Convex Optimization, CSE 527 Introduction to Computer Vision, CSE 114 Computer Science I - Procedural and object-oriented programming, CSE 305 Principles of Database Systems.

- **Technical Team Lead – Ejada, Alexandria, Egypt** **May 2013 – June 2016**

Development team leader for a team of 5 members developing a large-scale software system for electricity reading with both web and mobile integrated systems, in addition to personally investigating performance optimizations.

- **Senior Software Engineer – Ejada, Alexandria, Egypt** **June 2007 – May 2013**

Design and implement pilot and other analyses workflows for the poison control centers automation system.
Develop and support ERP systems framework, and solely implement Business Rules, Payroll, and Vacations Engines.

- **Software Engineer – GPS Experts, Alexandria, Egypt** **July 2006 – May 2007**

Develop most image processing algorithms, GUI, and functionalities for a GIS application for as-built road reporting and feature extraction for the department of transportation.

- **Software Engineer – eSpace, Alexandria, Egypt** **August 2005 – May 2006**

Develop dynamic report generation tools and content management system customization.

CERTIFICATES

- **Coursera Deep Learning Specialization (deeplearning.ai – Instructor: Professor Andrew Ng)**:
  Certificate URL: https://www.coursera.org/account/accomplishments/specialization/5WMNZTSLXHBX

SKILLS

- *Programming Languages and Tools:* Python, PyTorch, OpenSlide, OpenCV, Scikit-learn, DGL, NetworkX, Tensorflow, Matlab, C/C++, Java, C#, Javascript, SQL.
- *Spoken Languages:* English, Arabic