

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](#).

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**

Thesis: Deep Learning with Cellular Context for Digital Pathology: A Spatial and Topological Perspective.

MSc in Computer Science – University of Alexandria, Egypt

Sep 2005 – Jan 2011

(Part time while working full time job.)

Thesis: Enhancing Cache Performance via Adaptive Set-Based Partitioning.

BSc in Computer Science – University of Alexandria, Egypt

Sep 2000 – Jun 2005

SELECTED PUBLICATIONS

Topology-Guided Multi-Class Cell Context Generation for Digital Pathology

[S. Abousamra](#), R. Gupta, T. Kurc, D. Samaras, J. Saltz, C. Chen. In IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023 (acceptance rate 25.78%) (Featured in CVPR Daily magazine).

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. In Medical Imaging with Deep Learning (MIDL), 2023 (Oral).

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. In *Frontiers in Oncology*, 2022.

Multi-Class Cell Detection Using Spatial Context Representation

[S. Abousamra](#), D. Belinsky, J. Arnab, F. Allard, E. Yee, R. Gupta, T. Kurc, D. Samaras, J. Saltz, C. Chen. In IEEE/CVF International Conference on Computer Vision (ICCV), 2021, (Oral acceptance rate 3%).

Localization in the Crowd with Topological Constraints

[S. Abousamra](#), M. Hoai, D. Samaras, C. Chen. In AAAI Conference in Artificial Intelligence (AAAI), 2021, (acceptance rate 21.4%).

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. In *Diagnostic Pathology*, no. 1 (2020): 1-11.

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. In IEEE International Symposium on Biomedical Imaging (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. In *The American Journal of Pathology*, 2020.

Localization and Tracking in 4D Fluorescence Microscopy Imagery

[S. Abousamra](#), S. Adar, N. Elia, R. Shilkrot. In CVPR Workshops - IEEE Workshop on Computer Vision for Microscopy Image Analysis (CVMI), 2018.

AWARDS AND RECOGNITIONS

Article in [CVPR Daily Magazine](#), June 2023, covering our paper:

Topology-Guided Multi-Class Cell Context Generation for Digital Pathology, CVPR 2023.

Doctoral Consortium Award, CVPR 2023

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