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. Arnam, 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**
  Project: Representation learning with language-vision models for biomedical data.
  June 2022 – September 2022

- **Applied Scientist Intern – Amazon**
  Project: Clustering refinement from edge similarity features using graph neural networks.
  June 2021 – September 2021

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

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

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

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

- **Software Engineer – eSpace, Alexandria, Egypt**
  Develop dynamic report generation tools and content management system customization.
  August 2005 – May 2006

CERTIFICATES

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

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