



## Shahira Abousamra

Postdoctoral Scholar, Biomedical Data Sciences

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#### BIO

Shahira Abousamra is a Postdoctoral scholar in the department of Biomedical Data Science at Stanford University, working with Dr. Sylvia Plevritis at the Plevritis Lab. She earned her PhD in Computer Science from Stony Brook University in 2024 under the supervision of Dr. Chao Chen and Dr. Dimitris Samaras.

In her research, she integrates mathematical modeling with computer vision to create more robust solutions, particularly in the context of advancing cancer research and enhancing our understanding of the tumor microenvironment. She leverages computational topology and spatial statistics to provide spatial semantic grounding to complement machine learning models. She publishes in top computer vision, artificial intelligence, and medical image analysis conferences including CVPR, ECCV, ICCV, AAAI, and MICCAI.

#### HONORS AND AWARDS

- Rising Stars in Data Science Workshop, Stanford University (2025)
- Rising Stars in EECS Workshop, MIT and Boston University (2025)
- Doctoral Consortium Award, The IEEE/CVF Conference on Computer Vision and Pattern Recognition, CVPR (2023)
- Outstanding Reviewer, International Conference on Computer Vision, ICCV (2023)

#### PROFESSIONAL EDUCATION

- Master of Science, Alexandria University (2011)
- Bachelor of Science, Alexandria University (2005)
- Doctor of Philosophy, S.U.N.Y. State University at Stony Brook (2024)
- Ph.D., Stony Brook University , Computer Science (2024)

#### STANFORD ADVISORS

- Sylvia Plevritis, Postdoctoral Faculty Sponsor

### Publications

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#### PUBLICATIONS

- **Label-Efficient Deep Color Deconvolution of Brightfield Multiplex IHC Images** *IEEE Transactions on Medical Imaging*  
Abousamra, S., Fassler, D., Gupta, R., Kurc, T., Escobar-Hoyos, L. F., Samaras, D., Shroyer, K. R., Saltz, J., Chen, C.  
2025: 853-864

- **TopoCellGen: Generating Histopathology Cell Topology with a Diffusion Model** *The IEEE/CVF Conference on Computer Vision and Pattern Recognition, CVPR*  
Xu, M., Gupta, S., Hu, X., Li, C., Abousamra, S., Samaras, D., Prasanna, P., Chen, C.  
2025
- **MATCH: Multi-faceted Adaptive Topo- Consistency for Semi-Supervised Histopathology Segmentation** *The Thirty-Ninth Annual Conference on Neural Information Processing Systems, NeurIPS*  
Xu, M., Hu, X., Abousamra, S., Li, C., Chen, C.  
2025
- **New Spatial Phenotypes from Imaging Uncover Survival Differences for Breast Cancer Patients.** *ACM-BCB ... : the ... ACM Conference on Bioinformatics, Computational Biology and Biomedicine. ACM Conference on Bioinformatics, Computational Biology and Biomedicine*  
Hasan, M., Kim Silva, A., Abousamra, S., Tang, S. J., Prasanna, P., Saltz, J., Gardner, K., Chen, C., Yurovsky, A.  
2024; 2024
- **Semi-supervised Segmentation of Histopathology Images with Noise-Aware Topological Consistency.** *Computer vision - ECCV ... : ... European Conference on Computer Vision : proceedings. European Conference on Computer Vision*  
Xu, M., Hu, X., Gupta, S., Abousamra, S., Chen, C.  
2024; 15136: 271-289
- **Hard Negative Sample Mining for Whole Slide Image Classification.** *Medical image computing and computer-assisted intervention : MICCAI ... International Conference on Medical Image Computing and Computer-Assisted Intervention*  
Huang, W., Hu, X., Abousamra, S., Prasanna, P., Chen, C.  
2024; 15004: 144-154
- **Spatial Diffusion for Cell Layout Generation.** *Medical image computing and computer-assisted intervention : MICCAI ... International Conference on Medical Image Computing and Computer-Assisted Intervention*  
Li, C., Hu, X., Abousamra, S., Xu, M., Chen, C.  
2024; 15004: 481-491
- **Uncertainty Estimation for Tumor Prediction with Unlabeled Data.** *Conference on Computer Vision and Pattern Recognition Workshops. IEEE Computer Society Conference on Computer Vision and Pattern Recognition. Workshops*  
Yun, J., Abousamra, S., Li, C., Gupta, R., Kurc, T., Samaras, D., Van Dyke, A., Saltz, J., Chen, C.  
2024; 2024: 6946-6954
- **Keratin 17 modulates the immune topography of pancreatic cancer.** *Journal of translational medicine*  
Delgado-Coka, L., Horowitz, M., Torrente-Goncalves, M., Roa-Peña, L., Leiton, C. V., Hasan, M., Babu, S., Fassler, D., Oentoro, J., Bai, J. K., Petricoin, E. F., Matrisian, L. M., Blais, et al  
2024; 22 (1): 443
- **ChampKit: A framework for rapid evaluation of deep neural networks for patch-based histopathology classification.** *Computer methods and programs in biomedicine*  
Kaczmarzyk, J. R., Gupta, R., Kurc, T. M., Abousamra, S., Saltz, J. H., Koo, P. K.  
2023; 239: 107631
- **Unsupervised Stain Decomposition via Inversion Regulation for Multiplex Immunohistochemistry Images.** *Proceedings of machine learning research*  
Abousamra, S., Fassler, D., Yao, J., Gupta, R., Kurc, T., Escobar-Hoyos, L., Samaras, D., Shroyer, K., Saltz, J., Chen, C.  
2023; 227: 74-94
- **Topology-Guided Multi-Class Cell Context Generation for Digital Pathology.** *Proceedings. IEEE Computer Society Conference on Computer Vision and Pattern Recognition*  
Abousamra, S., Gupta, R., Kurc, T., Samaras, D., Saltz, J., Chen, C.  
2023; 2023: 3323-3333
- **GaNDLF: the generally nuanced deep learning framework for scalable end-to-end clinical workflows** *COMMUNICATIONS ENGINEERING*  
Pati, S., Thakur, S. P., Hamamci, I., Baid, U., Baheti, B., Bhalerao, M., Gueley, O., Mouchtaris, S., Lang, D., Thermos, S., Gotkowski, K., Gonzalez, C., Grenko, et al  
2023; 2 (1)
- **Calibrating Uncertainty for Semi-Supervised Crowd Counting**

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Li, C., Hu, X., Abousamra, S., Chen, C., IEEE  
IEEE COMPUTER SOC.2023: 16685-16695

- **Multi-Class Cell Detection Using Spatial Context Representation.** *Proceedings. IEEE International Conference on Computer Vision*  
Abousamra, S., Belinsky, D., Van Arnam, J., Allard, F., Yee, E., Gupta, R., Kurc, T., Samaras, D., Saltz, J., Chen, C.  
2021; 2021: 3985-3994
- **Deep Learning-Based Mapping of Tumor Infiltrating Lymphocytes in Whole Slide Images of 23 Types of Cancer.** *Frontiers in oncology*  
Abousamra, S., Gupta, R., Hou, L., Batiste, R., Zhao, T., Shankar, A., Rao, A., Chen, C., Samaras, D., Kurc, T., Saltz, J.  
2021; 11: 806603
- **Localization in the Crowd with Topological Constraints**  
Abousamra, S., Hoai, M., Samaras, D., Chen, C., Assoc Advancement Artificial Intelligence  
ASSOC ADVANCEMENT ARTIFICIAL INTELLIGENCE.2021: 872-881
- **Deep learning-based image analysis methods for brightfield-acquired multiplex immunohistochemistry images.** *Diagnostic pathology*  
Fassler, D. J., Abousamra, S., Gupta, R., Chen, C., Zhao, M., Paredes, D., Batool, S. A., Knudsen, B. S., Escobar-Hoyos, L., Shroyer, K. R.,  
Samaras, D., Kurc, T., Saltz, et al  
2020; 15 (1): 100
- **Utilizing Automated Breast Cancer Detection to Identify Spatial Distributions of Tumor-Infiltrating Lymphocytes in Invasive Breast Cancer.** *The American journal of pathology*  
Le, H., Gupta, R., Hou, L., Abousamra, S., Fassler, D., Torre-Healy, L., Moffitt, R. A., Kurc, T., Samaras, D., Batiste, R., Zhao, T., Rao, A., Van Dyke,  
et al  
2020; 190 (7): 1491-1504
- **WEAKLY-SUPERVISED DEEP STAIN DECOMPOSITION FOR MULTIPLEX IHC IMAGES**  
Abousamra, S., Fassler, D., Hou, L., Zhang, Y., Gupta, R., Kurc, T., Escobar-Hoyos, L. F., Samaras, D., Knudson, B., Shroyer, K., Saltz, J., Chen, C.,  
IEEE  
IEEE.2020: 481-485