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SUMMARY OF QUALIFICATIONS

- PhD in Electrical Engineering with **9+** years of experience in **Data Science, Machine Learning, Deep Learning, Computer Vision** and **Natural Language Processing**.
- Co-founder of **easy-tensorflow** (with >2.5K stars on GitHub) and 7+ years of experience in **teaching ML/DL algorithms** and holding 10+ workshops and bootcamps.
- Authored multiple papers in high-tier journals including **Nature Communications**, with **200+** citations and reviewed multiple journal/conference papers.
- Developed, deployed and improved upon existing AI models to increase scalability, efficiency and utilization for large datasets on **cloud infrastructures** and **High Performance Computing (HPC)** clusters.

PROFESSIONAL EXPERIENCE

I. Mayo Clinic June 2023 – Present
Principal Data Science Analyst

- Conduct research, design, and implement deep learning models for computer vision tasks such as object detection, segmentation and classification on large image datasets. Use GenAI techniques such as GANs, VAEs and Diffusion Models for synthetic generation of data to be used in data augmentation and image to image translation.
- Develop and implement Large Language Models (LLMs) for natural language processing tasks such as summarization, Retrieval-Augmented Generation (RAG), Named Entity Recognition (NER). Fine-tune foundation models, using advanced techniques such as prompt engineering, Parameter-Efficient Fine-Tuning (PEFT), Low-Rank Adaptation (LoRA), and Reinforcement Learning (RL)-based models to optimize performance and adapt the models to specific domains and tasks.
- Deploy models on Google Cloud Platform using containerization and Docker to leverage scalable computing resources and state-of-the-art infrastructure to enable efficient handling and processing of extensive datasets, optimizing performance and accessibility of the models across different environments.

II. National Institute of Health Feb 2020 – June 2023
Postdoctoral Fellow

- Develop customized open-source visualization, machine learning, deep learning and computer vision tools for comprehensive 2D/3D image analysis of large multiplex fluorescence immunohistology datasets.
- Hands on experience with large-scale datasets and big data, specifically big image datasets of 300,000 x 300,000 pixels and 150 channels.
- Propose new algorithms or utilize existing AI-based algorithms to generate quantitative results for hypothesis-testing.
- Develop user-friendly GUIs for algorithms and pipeline for ease-of-use.
- Provide consultation to biomedical image analysis companies on integration of visualization and quantification algorithms using AI-based algorithms.

II. University of Houston, Houston, Texas Aug 2015 – Dec 2019
Research Assistant

- Discovered and analyzed patterns using clustering techniques such as hierarchical clustering and the Dirichlet process mixture models in massive biomedical dataset of size > 300GB
- Utilized deep neural networks for abstract feature extraction and unsupervised cell type cluster labeling with > 88% accuracy

- Validated and edited the segmentation results of whole brain images using object detection methods such as Faster-RCNN with > 90% recall to increase the accuracy of the segmentation algorithms
- Used pattern recognition methods such as outlier detection to detect errors with AUC > 70%
- Designed GUI to visualize the mapping between the analysis results and the raw data
- Detected and classified cells in whole rat brain images with AUC of > 96%
- Developed a comprehensive pipeline for fluorescence signal correction of multi-spectral wide field microscopic images correcting for non-specific signals such as auto-fluorescence, non-uniform illumination, tissue folds, bleed-through and molecular co-localization

EDUCATION

- University of Houston**, Houston, TX, U.S. Aug 2015 – Dec 2019
Ph.D., Electrical Engineering; **GPA: 4**
- Isfahan University of Technology**, Isfahan, Iran Sep 2012 – Jul 2014
M.S., Electrical Engineering
- Imam Khomeini International University**, Qazvin, Iran Sep 2008 – Jul 2012
B.S., Electrical Engineering

TECHNICAL SKILLS

- **Programming:** Python | MATLAB | SQL | R | C++ | CUDA | CMake
- **Tools and Libraries:** TensorFlow | PyTorch | scikit-learn | OpenCV | scikit-image | Qt
- **Environments and Editors:** Microsoft Visual Studio | PyCharm | Jupyter Notebook
- **Version Control:** Git, Github, Azure DevOps
- **Containerization:** Docker
- **Image Editing:** Adobe Photoshop
- **Typesetting Applications:** Microsoft Office, L^AT_EX
- **Bilingual:** English, Persian

PUBLICATIONS

- King, D. M., Sapio, M. R., Staedtler, E. S., Maric, D., Jahanipour, J., Ghetti, A., ... & Mannes, A. J. (2024). Molecular-Cellular Analysis of Macrophage-Like Perineural Cells in Human Dorsal Root Ganglion Tissue. *The Journal of Pain*, 25(4), 17.
- Ramsden, C.E., Zamora, D., Horowitz, M.S., Jahanipour, J., Calzada, E., Li, X., Keyes, G.S., Murray, H.C., Curtis, M.A., Faull, R.M. and Sedlock, A., 2023. ApoER2-Dab1 disruption as the origin of pTau-associated neurodegeneration in sporadic Alzheimer's disease. *Acta Neuropathologica Communications*, 11(1), p.197.
- Sapio, M.R., King, D.M., Staedtler, E.S., Maric, D., Jahanipour, J., Kurochkina, N.A., Manalo, A.P., Ghetti, A., Mannes, A.J. and Iadarola, M.J., 2023. Expression pattern analysis and characterization of the hereditary sensory and autonomic neuropathy 2 A (HSAN2A) gene with no lysine kinase (WNK1) in human dorsal root ganglion. *Experimental Neurology*, 370, p.114552.
- Ksendzovsky, A., Bachani, M., Altshuler, M., Walbridge, S., Mortazavi, A., Moyer, M., Chen, C., Fayed, I., Steiner, J., Edwards, N., Inati, S.K., Jahanipour, J., Maric, D., Heiss, J.D., Kapur, J. and Zaghoul K.A., 2023. Chronic neuronal activation leads to elevated lactate dehydrogenase A through the AMP-activated protein kinase/hypoxia-inducible factor-1's hypoxia pathway. *Brain Communications*, 5(1), p.fcac298.
- Mortazavi, A., Fayed, I., Bachani, M., Dowdy, T., Jahanipour, J., Khan, A., Owotade, J., Walbridge, S., Inati, S.K., Steiner, J. and Wu, J., 2022. IDH Mutated Gliomas Promote Epileptogenesis through D-2-Hydroxyglutarate Dependent mTOR Hyperactivation. *Neuro-oncology*.
<https://doi.org/10.1093/neuonc/noac003>
- Maric, D., Jahanipour, J., Li, X.R. et al. "Whole-brain tissue mapping toolkit using large-scale highly multiplexed immunofluorescence imaging and deep neural networks". *Nat Commun* **12**, 1550 (2021). <https://doi.org/10.1038/s41467-021-21735-x>
- Yuan, P., Mobiny, A., Jahanipour, J., Li, X., Cicalese, P.A., Roysam, B., Patel, V.M.,

Dragan, M. and Van Nguyen, H., 2020, October. Few Is Enough: Task-Augmented Active Meta-Learning for Brain Cell Classification. In International Conference on Medical Image Computing and Computer-Assisted Intervention (pp. 367-377). Springer, Cham. <https://arxiv.org/pdf/2007.05009.pdf>

- S. Berisha, M. Lotfollahi, J. Jahanipour, I. Gurcan, M. Walsh, R. Bhargava, H. V. Nguyen, D. Mayerich. "Deep learning for FTIR histology: leveraging spatial and spectral features with convolutional neural networks" Analyst, <https://doi.org/10.1039/C8AN01495G>
- S. Ahmadian, B. Vahidi, J. Jahanipour, S.H. Hosseinian, H. Rastegar "Price Restricted Optimal Bidding Model Using Derated Sensitivity Factors by Considering Risk Concept." IET Generation, Transmission & Distribution. doi: 10.2 (2016): 310-324.

POSTER
PRESENTATIONS

- J. Jahanipour, X. Li, B. Roysam, D. Maric. "Python-based Open-Source Toolkit for Large-Scale Analysis of Highly-Multiplexed Immuno-fluorescence Brain Tissue Image Datasets" BRAIN Initiative toolmaker social, Neuroscience 2022 Fall 2022
- J. Jahanipour, B. Roysam, A. Sedlock, D. Maric. "Improved spatial registration method for highly multiplexed gigapixel immunohistological image datasets in brain mapping studies" Neuroscience 2021 Fall 2021
- J. Jahanipour, X. Li, D. Maric, B. Roysam. "Multiscale Mapping of Cellular Alterations in Brain Tissue" BioImage Informatics Conference - Allen Brain Institute Fall 2019
- J. Jahanipour, X. Li, A. Sedlock, B. Roysam, J. Smith, D. Maric. "Quantitative In-situ Image Analysis in Highly Multiplexed Fluorescence IHC Image Datasets of Rat Brain" NINDS DIR Scientific Retreat -NIH Summer 2018
- J. Jahanipour, X. Li, H.Lu, J. Redell, P. Dash, D. Maric, B. Roysam. "Computational profiling of astrocytes' activation patterns after mild fluid percussion injury" Mission Connect Annual Scientific Symposium Winter 2017
- J. Jahanipour, H. V. Nguyen, J. Redell, P. Dash, D. Maric, B. Roysam. "Deep Hierarchical Profiling & Pattern Discovery: Application to Whole Brain Rat Slices After Traumatic Brain Injury" Graduate Research Conference, ECE, UH Summer 2018

INVITED TALKS &
WORKSHOPS

- "Biomedical Image Analysis with Python" FAES @ NIH October 2023
- "Introduction to Machine Learning and Deep Learning" National Library of Medicine (NLM) Data Science Bootcamp June 2019
- "Introduction to Machine Learning and Deep Learning" 2019 Data Science in Materials Workshop April 2019
- "Deep Learning with TensorFlow Workshop" UH Math department Spring 2019
- "Deep Learning with TensorFlow Workshop" UH Math department Spring 2018
- "Deep Learning with TensorFlow Workshop" UH CACDS Spring 2018
- "Applications of Deep Learning in Biomedical Datasets and Workshop on Deep Learning with TensorFlow" IEEE EMBS Houston Chapter Dec 2017

PROFESSIONAL
SERVICE

- Journal Reviewers:
 - IEEE Transactions on Medical Imaging
 - Nature Translational Psychiatry
 - Nature Methods
 - eLife
 - MDPI Bioengineering
 - IEEE Transactions on Industrial Informatics
 - Journal of Modern Power Systems and Clear Energy (MPCE)
- Conference Reviewers:
 - IEEE International Symposium on Biomedical Imaging (ISBI)
 - Medical Image Computing and Computer-Assisted Intervention (MICCAI)