Arash Abadpour

hands-on machine vision/deep learning/cloud developer w/ 12+ years of experience in North America

Technical Skills

Deep Learning, *object detection, image classification, and semantic segmentation for aerial and static-camera images.*

Agritech, *vertical farm/orchard vision applications, tree detection and localization, seed/blossom/fruit counting, size estimation, and plant statistics.*

Insurance, *Aerial image analysis for roof and yard damage assessment and object detection.*

Machine Vision, *camera models, triangulation, pose estimation.*

Python, *TensorFlow, PyTorch, MLFLow, OpenCV, Boto3, PyQt, PyMySQL, NumPy, SciPy, Matplotlib, scikit-learn, Pandas, Seaborn, Jupyter, Django, Fiftyone.*

Linux, *bash programming, Ubuntu, Raspbian.*

Cloud, *Amazon S3, Amazon Simple Queue Service, Amazon EC2, GCS, slurm.*

Databases, *MySQL, Amazon RDS, PostgreSQL.*

Software Development, *agile development, JIRA, git, papertrail, ci/cd, docker.*

Hardware, *Jetson, integration w/ cameras and sensors, Raspberry Pi, 3D design and print, general electronics, general digital electronics, general circuits.*

example of work: github.com/kamangir/blue-rvr

Experience

2022–2022 **Senior Machine Learning Engineer (Computer Vision)**, *Vivid Machines, Toronto, Canada.*
Smart technology to help fruit and vegetable farmers optimize quality and yield.

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2020–2022 **Vice President, Data Science**, *Savormetrics Inc., Mississauga, Canada*.
Deep Learning + Food Inspection = Increasing Profits. Reducing Waste. Improving Customer Satisfaction.

2019–2020 **Lead Data Scientist**, *Betterview Marketplace, San Diego, USA*.
Design, development, and deployment of a deep learning framework that consumes aerial images and other types of data relevant to the insurance industry and produces property insights.

2016–2019 **Senior Scientific Developer**, *Fio Corporation, Toronto, Canada*.
Design, development, and deployment of a learning-enabled machine vision system that visually identifies and analyzes rapid diagnostics tests (rdt) for infectious diseases such as HIV, Malaria, Dengue, Zika, and others. At inference time, the ML models are run on an android device with limited network and power access. Therefore, battery usage optimization and tolerance to long periods of disconnectivity were essential considerations. Traceability management for data and models was a vital component of this work due to national and international regulatory requirements.

2015–2016 **Research Scientist**, *Intellijoint Surgical, Waterloo, Canada*.
Extensions of the capabilities of a monocular infrared tracking system that was a component within the surgical navigation product that utilized machine vision to carry out and confirm geometrical measurements in-vivo. Also, worked on the inertial data that was produced by the system for validation and augmentation. Parameter estimation using least mean square and Levenberg-Marquardt cost function minimization.

2009–2015 **Researcher**, *Imaging Group, Epson Canada Limited, Toronto, Canada*.
Research and development on future products and concepts in the fields of visual inspection, symbology detection, 3d object detection and pose estimation, camera calibration (monocular, stereo, and depth/range), augmented and virtual reality, 3d scan/display systems (stereo, time-of-flight, structured light projection, and other depth sensors), depth processing (including bilateral upsampling, filtering, and registration and fusion of multiple depth and flat cameras using different variations of iterative closest point - icp), head-mounted displays, and robotics. Stochastic optimization in the presence of outliers using RANSAC and robustified cost minimization.

2001–2004 **Process Control Engineer**, *Karband Eng. Co., Tehran, Iran*.
Design, implementation and erection of PLC-based control systems for medium-sized machinery in pipe and profile production plants.

1998–2001, 2004–2009 **Research Assistant**, *University of Manitoba, Telecommunications Research Laboratories (TRLabs) Winnipeg and Biomechanics Laboratory, Sharif University of Technology*.
Network optimization, earthquake damage detection using satellite/aerial imagery, human gait analysis, 3d surface reconstruction, color image watermarking and data-hiding, visual encryption, image compression, color transfer, grayscale image colorization, computational photography, fuzzy clustering, skin detection, and pornography classification. Fuzzy modelling of multi-layer systems, especially within the field of pattern recognition, using Bayesian models.

Education

2005–2009 **Ph.D.**, *The University of Manitoba, Canada*.
Electrical and Computer Engineering Department

2003–2005 **Master of Science**, *Sharif University of Technology, Iran*.
Mathematics Science Department, Computer Science Group (Scientific Computation)

1996–2003 **Bachelor of Science**, *Sharif University of Technology, Iran*.
Electrical Engineering Department, Control Group

Certifications

2022 **AWS Cloud Technical Essentials**.
By Amazon Web Services on Coursera

2019 **Deep Learning Specialization**, *Five-Course Specialization*.
By Andrew Ng (deeplearning.ai)

2017 **Neural Networks for Machine Learning**.
By the University of Toronto on Coursera

2017 **Machine Learning**.
By Stanford University on Coursera

2017 **Machine Learning**, *Four-Course Specialization*.
By the University of Washington on Coursera

2013 **Patents**, *Understanding Patents - An Introductory Course*.
McGill University School of Continuing Studies

Patents

"*System, method and/or computer readable medium for non-invasive workflow augmentation*", WO Application Number WO2018094534A1, Priority Date 26 November 2016.

"*System, method and/or computer-readable medium for identifying and/or localizing one or more rapid diagnostic tests*", WO Application Number WO2018094533A1, Priority Date 26 November 2016.

"*Visual pattern recognition system, method and/or computer-readable medium*", WO Application Number WO2018094532A1, Priority Date 26 November 2016.

"*Systems and methods for tracker characterization and verification*", US Application Number US20170345177A1, Priority Date 27 May 2016.

"*Systems, methods and devices to scan 3d surfaces for intra-operative localization*", International Publication Number WO2017185170A1, Priority Date 28 April 2016.

"*Method for object pose estimation, apparatus for object pose estimation, method for object estimation pose refinement and computer readable medium*", Japanese Patent JP2013050947A, Publication Date 19 October 2016.

"*HMD Calibration with Direct Geometric Modeling*", US Patent US20160012643A1, Publication Date 14 January 2016.

"*HMD Calibration with Direct Geometric Modeling*", EU Patent No. 15175799.4 - 1902, Filing Date 8 July 2015.

"*System generating three-dimensional model, method and program*", Japanese Patent JP2015176600A, Publication Date 5 October 2015.

"*Holocam Systems and Methods*", US Patent US20150261184, Publication Date 17 September 2015.

"*Method and Apparatus for Improved Training of Object Detecting System*", US Patent US20140079314, Publication Date 20 March 2014.

"*Method for simulating impact printer output, evaluating print quality, and creating teaching print samples*", US Patent 8654398, Publication Date 18 February 2014.

"*Method and apparatus for object pose estimation*", US Patent 8467596, Publication Date 18 June 2013.

Select Publications

Journal Paper, *On Applications of Pyramid Doubly Joint Bilateral Filtering in Dense Disparity Propagation*, Arash Abadpour, 3D Research, Volume 5, Issue 2, 25 April 2014, Pages 1–20.

Ph.D. Thesis, *QoS-Constrained Information Theoretic Capacity Maximization in CDMA Systems*, Electrical and Computer Engineering Department, University of Manitoba, Winnipeg, Manitoba, Canada, Supervised by Prof. Attahiru Sule Alfa (Ph.D.), 2005–2009.

M.Sc. Thesis, *Color Image Processing using Principal Component Analysis*, Mathematics Science Department, Sharif University of Technology, Tehran, Iran, Supervised by Shohreh Kasaei (Ph.D.) and A. Daneshgar (Ph.D.), 2004–2005.

more: Google Scholar
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