



Alireza Ghasemi

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📍 aghasemi • Born April 1987, Iranian citizen, Swiss B permit holder.

Research Interests

Computer Vision and Image Processing: Image Retrieval and Localization, Multi-Camera Reconstruction, Tracking, Video Processing, Computational Photography, Augmented Reality.

Machine Learning and Pattern Recognition: Semi-Supervised and Active Learning, One-Class Learning, Multi-view Learning, Human Computation.

Information Retrieval, Data Mining and Big Data: Text Classification, Rank and Metric Learning, Sentiment Analysis.

Education

École Polytechnique Fédérale de Lausanne

PhD, Computer and Communication Sciences

Granted doctoral fellowship by the school of computer and communication sciences. Supervised by Professor Martin Vetterli and Dr. Adam James Scholefield.

Lausanne, Switzerland

September 2011 – December 2016

Sharif Univeristy of Technology

M.Sc., Artificial Intelligence

Ranked 1st by GPA (19.52/20) among the class of 2011. Supervised by Professor M.T. Manzuri.

Tehran, Iran

September 2009 – August 2011

Sharif Univeristy of Technology

B.Sc., Software Engineering

Tehran, Iran

September 2005 – September 2009

Professional Experience

ELCA Informatique SA

Software Engineer

Lausanne, Switzerland

January 2017 – Present

École Polytechnique Fédérale de Lausanne

Doctoral Researcher

Lausanne, Switzerland

January 2012 – December 2016

In charge for cutting-edge research in the areas of computational photography, multi-camera systems and image-based indoor localization. I developed mainly in MATLAB and Java with JavaScript for visualization and Python for scripting.

- Developed a patent and a track record of publications in light-field image retrieval and video analysis.
- Proposed the first publicly-available dataset for light-field object recognition.
- Participating as an R&D engineer in the development of an outdoor urban localization system.
- Developed a novel online game (using Play! and RESTful services) to exploit human computation paradigms in sentiment analysis.

Swiss Center for Electronics and Microtechnology (CSEM)

R&D Intern

Neuchâtel, Switzerland

October 2015 – March 2016

In charge of developing novel cutting-edge solutions for hyper-spectral imaging.

AI Lab - École Polytechnique Fédérale de Lausanne

Doctoral Assistant

Lausanne, Switzerland

September 2011 – January 2012

I was in charge for investigating novel solutions to incorporate the active learning framework into the recently proposed human computation paradigm. I developed a novel online game in Java (using the Play! framework and RESTful services) to exploit human computation paradigms in sentiment analysis.

DSP Lab - Sharif University of Technology

Research Assistant

Tehran, Iran

March 2010 – August 2011

In charge for development of innovative approaches for exploiting user feedback to improve the underlying machine learning model in an image retrieval system. I used MATLAB and Java to develop the system.

- Developed a novel robust one-class classification framework and added active and semi-supervised learning capability to the well-known Support Vector Data Description (SVDD) model.

Intelligent Information Systems (IIS) Laboratory

Web Developer

Tehran, Iran

October 2009 – March 2010

Database and web developer (PHP/Java) for a national-level enterprise project management system.

Peykasa Messageware Group

Backend Service Developer

Tehran, Iran

May 2009 – October 2009

Backend developer in an integrated messaging platform. I developed in JavaEE, GWT and AJAX.

Semantic Web Research Lab - Sharif University of Technology

R&D Assistant

Tehran, Iran

January 2009 – May 2009

Developer of an intelligent system (in Java) to categorise websites exploiting their internal link structure.

Mabna Software

Software Engineering Intern

Tehran, Iran

June 2008 – September 2008

R&D engineer and analyst for the Pars statistical machine translation in Java and C#.

Teaching Experience

Digital Signal Processing

Teaching Assistant for the online course offered on the Coursera platform.

Lausanne, Switzerland

Spring 2014

Instructed by Dr. Paolo Prandoni and Professor Martin Vetterli.

Mathematical Foundations of Signal Processing <i>Teaching Assistant at École Polytechnique Fédérale de Lausanne</i> Instructed by Dr. Jayakrishnan Unnikrishnan, Dr. Mihailo Kolundzija and Professor Martin Vetterli.	Lausanne, Switzerland <i>Fall 2013</i>
Statistical Signal Processing <i>Teaching Assistant at École Polytechnique Fédérale de Lausanne</i> Instructed by Dr. Andrea Ridolfi, Dr. Mihailo Kolundzija and Dr. Ivana Jovanovic.	Lausanne, Switzerland <i>Spring 2013</i>
Introduction to Programming (Informatique I) <i>Teaching Assistant at École Polytechnique Fédérale de Lausanne</i> Instructed by Dr. Jean-Philippe Pellet	Lausanne, Switzerland <i>Fall 2012</i>
Statistical Pattern Recognition <i>Teaching Assistant at Sharif University of Technology</i>	Tehran, Iran <i>Fall 2011</i>
Introduction to Database Design <i>Teaching Assistant at Sharif University of Technology</i>	Tehran, Iran <i>Spring 2009 - Spring 2010</i>
Introduction to Database Design <i>Teaching Assistant at Shahid Beheshti University</i>	Tehran, Iran <i>Spring 2009 - Spring 2010</i>
Advanced Programming <i>Lecturer at Payam-e-Noor University of Qeshm</i>	Qeshm, Iran <i>Fall 2009</i>
Introduction to Programming <i>Teaching Assistant at Sharif University of Technology</i>	Tehran, Iran <i>Fall 2006</i>

Patents

Consistent and Optimal Reconstruction of Linearly-Related Variables: *Alireza Ghasemi*; Adam Scholefield; Martin Vetterli, Provisional Patent, Filed September 2015.

Method and Apparatus for Identifying Local Features: *Alireza Ghasemi*; Laurent Rime; Martin Vetterli, Swiss Patent No. 2013CH-1102, Filed June 2013.

Distinguishing Real Scenes from Printed Photos Using a Light-Field Camera: *Alireza Ghasemi*; Laurent Rime; Martin Vetterli, US-61898739, Provisional Patent Filed November 2013.

Publications

SHAPE: Linear-Time Camera Pose Estimation With Quadratic Error-Decay: *Alireza Ghasemi*; Adam Scholefield and Martin Vetterli, IEEE ICASSP 2016. Shanghai, China

On the Accuracy of Point Localisation in a Circular Camera Array: *Alireza Ghasemi*; Adam Scholefield and Martin Vetterli, IEEE ICIP 2015. Quebec City, Canada (*Selected as Top 10 %*)

Detecting Planar Surface Using a Light-Field Camera with Applications to Distinguishing Real Scenes From Printed Photos: *Alireza Ghasemi* and Martin Vetterli, ICASSP 2014, Florence, Italy.

Scale-Invariant Representation of Light Field Images for Object Recognition and Tracking: *Alireza Ghasemi* and Martin Vetterli, IS&T/SPIE Electronic Imaging 2014, San Francisco, USA.

Computationally Efficient Background Subtraction in the Light Field Domain: *Alireza Ghasemi*; Mahdad Hosseini Kamal and Martin Vetterli, IS&T/SPIE Electronic Imaging 2014, San Francisco, California, USA, February 2-6, 2014.

LCAV-31: A Dataset for Light Field Object Recognition: *Alireza Ghasemi*; Nelly Afonso and

Martin Vetterli, IS&T/SPIE Electronic Imaging 2014, San Francisco, California, USA, February 2-6, 2014.

Sentiment Analysis Using a Novel Human Computation Game: Claudiu Cristian Musat; Alireza Ghasemi and Boi Faltings, ACL 2012 People's Web Meets NLP Workshop, 2012.

A Bayesian Approach to the Data Description Problem: Alireza Ghasemi et. al., AAAI Twenty-Sixth Conference on Artificial Intelligence (AAAI-12), 2012

Support Vector Data Description for Spoken Digit Recognition: Amirhossein Tavanaei; Alireza Ghasemi; Mohammad Tavanaei; Hossein Sameti and Mohammad T. Manzuri, International Conference on Bio-inspired Systems and Signal Processing (BIOSIGNALS 2012), 2012:32-37.

Active Learning from Positive and Unlabeled Data: Alireza Ghasemi; Hamid R. Rabiee; Mohsen Fadaee; Mohammad T. Manzuri; Mohammad H. Rohban, IEEE ICDM 2011 Workshop on Optimization Based Methods for Emerging Data Mining Problems (OEDM'11), 2011:244-250.

Active One-Class Learning by Kernel Density Estimation: Alireza Ghasemi; Mohammad T. Manzuri; Hamid R. Rabiee; Mohammad H. Rohban and Siavash Haghiri, IEEE International Workshop on Machine Learning for Signal Processing (MLSP'11), 2011:1-6.

Content-Based Image Retrieval Using Relevance Feedback and Semi-Supervised Learning: Alireza Ghasemi and M. T. Manzuri (Dir.), M. Sc. Thesis, Summer 2011.

A Survey on Website Classification Methods with Introduction to a New Method Based on Internal PageRanks: Alireza Ghasemi, Hassan Abolhassani (Dir.), B.Sc. Thesis, Summer 2009.

Honors and Awards

EPFL Bonus for Exceptional Performance <i>Granted a bonus salary increase due to exceptional performance at EPFL.</i>	Lausanne, Switzerland <i>Fall 2015</i>
IEEE Signal Processing Society Travel Grant <i>Granted the IEEE SPS Travel Grant to attend the conference ICIP 2015.</i>	Lausanne, Switzerland <i>Spring 2015</i>
Qualcomm Innovation Fellowship 2015 <i>Winner of the prestigious Qualcomm Innovation Fellowship (QInF'15).</i>	Lausanne, Switzerland <i>Spring 2015</i>
Doctoral Fellowship from the I&C School of EPFL <i>Granted full one-year fellowship to start PhD.</i>	Lausanne, Switzerland <i>Fall 2011</i>
Ranked 1st in the Artificial Intelligence section of the Sharif University <i>Ranked by GPA.</i>	Tehran, Iran <i>Summer 2011</i>
Ranked 1st in the nationwide graduate entrance exam in IT engineering <i>Among more than 13,000 students.</i>	Tehran, Iran <i>Summer 2009</i>
Ranked 1st in the national graduate entrance exam in computer engineering <i>Among more than 17,000 students. Computer Architecture and AI sections.</i>	Tehran, Iran <i>Summer 2009</i>
Ranked 183rd (top 0.06%) in the nationwide university entrance exam <i>Among more than 300,000 students in the Mathematics branch.</i>	Tehran, Iran <i>Summer 2005</i>
Ranked 33rd (top 0.006%) in the nationwide university entrance exam <i>Among more than 500,000 students in the Foreign Languages branch.</i>	Tehran, Iran <i>Summer 2005</i>

Selected Courses

Doctoral School: Foundations of Imaging Sciences (6/6), Convex Optimization (5.5/6), Statistical Signal Processing (5.5/6).

Graduate School: Image Processing (19.2/20), Speech Processing (19/20), Machine Learning (19.2/20), Pattern Recognition (19.5/20), Human and Computer Vision (20/20).

Undergraduate: Database Systems (18.5/20), Object-Oriented Design (18.8/20), System Analysis and Design (20/20), Software Engineering (19/20), Information Retrieval (20/20), Computer Networks (19.2/20), Compiler Design (20/20), Programming Languages (20/20).

Skills

Java Development: Expert. In-depth knowledge of JavaSE, JavaFX, Swing, JDBC, Weka, etc. Working knowledge in Android development

JavaScript: Experienced in Node.js, Chrome extensions, frameworks, client-side scripting, etc.

C: Experiences with OpenCV and Win32 API.

Web Development: Experiences in REST, Symfony, Spring MVC, Play!, GWT, Grails, etc.

Operating Systems: Linux (Debian, Fedora, Ubuntu), Windows.

Software Engineering: OOD, UML, Agile, Scrum, Design Patterns, Version Control (Git, SVN).

MATLAB: Proficient in Signal and Image Processing, Computer Vision and Pattern Recognition toolboxes.

Python: Experiences in Blender scripting, NumPy and SciPy, IPython Notebooks.

Typesetting: Fluent in \LaTeX .

Database Design: Experiences in SQL, ERD, NoSQL (MongoDB, Firebase).

Cloud Development: Google App Engine, Microsoft Azure, IaaS, Meteor.

Other Programming Languages: Experiences in Clojure, R and Scala.

Languages

Persian: Native

English: Full professional proficiency

Used extensively in study and work. C1 level.

French: Limited working proficiency

Learning since 2012. Currently in B1 level.

German: Limited working proficiency

Learning since 2013. Currently in A2 level.

Arabic: Elementary proficiency

Learned basics in high school.

Interests

Reading: Literature, History, Technology. Gaining general knowledge through studying novel topics.

References

Available upon request