Alireza Ghasemi

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Research Interests

Computer Vision and Image Processing
Image Retrieval, Image-Based Localization, Multi-Camera Imaging, Augmented Reality.

Machine Learning and Pattern Recognition
Semi-Supervised and Active Learning, One-Class and 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   **Lausanne, Switzerland**
PhD, Computer, Communication and Information Sciences   *2011–Present*
Granted doctoral fellowship by the school of computer and communication sciences. Supervised by Professor Martin Vetterli and Dr. Adam James Scholefield.

Sharif Univeristy of Technology   **Tehran, Iran**
M.Sc., Artificial Intelligence   *2009–2011*
Ranked 1st by GPA ($\frac{19.52}{20}$) among the class of 2011. Supervised by Professor M.T. Manzuri

Sharif Univeristy of Technology   **Tehran, Iran**
B.Sc., Software Engineering   *2005–2009*

Experience

École Polytechnique Fédérale de Lausanne   **Lausanne, Switzerland**
Doctoral Researcher   *2011–Present*

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

- Developed a patent regarding inventions in the area of light-field image retrieval.
- Proposed the first publicly-available dataset for light-field object recognition.
- Participated as an R&D engineer in the development of an outdoor urban localization system exploiting light-field information.

DSP Lab - Sharif University of Technology   **Tehran, Iran**
Research Assistant   *2010–2011*
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   **Tehran, Iran**
Web Portal Developer   *2009–2010*
Database and front-end developer (PHP/Java) for a national-level enterprise project management system.

Peykasa Messageware Group   **Tehran, Iran**
Backend Service Developer   *May 2009– October 2009*
Developer of the Java backend in an integrated messaging platform incorporating e-mail and SMS services. Development was done in JavaEE, GWT and AJAX.

Mabna Software   **Tehran, Iran**
Software Engineering Intern   *June 2008– September 2008*
Participated in the development of the training dataset and implementation of novel algorithms for a statistical machine translation system for the Persian language (Pars Translator). I used Java and C# for development.

Teaching Experiences

École Polytechnique Fédérale de Lausanne   **Lausanne, Switzerland**
Teaching Assistant   *Fall 2012 – Fall 2014*
Teaching assistant in various graduate and undergraduate courses including Statistical Signal Processing, Mathematical Signal Processing and Digital Signal Processing (online course offered on the Coursera platform).

Sharif University of Technology   **Tehran, Iran**
Teaching Assistant   *Fall 2006 – Spring 2011*
Teaching assistant in various graduate and undergraduate courses including Introductory Programming, Database Design and Statistical Pattern Recognition.

Payam-e-Noor University of Qeshm   **Qeshm, Iran**
Lecturer   *Fall 2009*
Lecturer of Introductory and Advanced Programming courses.

Publications

Patents

- **Alireza Ghasemi**, Laurent Rime, Martin Vetterli, *Distinguishing real scenes from printed photos using a light-field camera*. US-61898739, Provisional Patent Filed November 2013.
- **Alireza Ghasemi**, Laurent Rime, Martin Vetterli: *Method and Apparatus for Identifying Local Features*. Swiss Patent No. 2013CH-1102, Filed June 2013.

Papers

- **Alireza Ghasemi** and Martin Vetterli: *Detecting Planar Surface Using a Light-Field Camera with Application to Distinguishing Real Scenes From Printed Photos*. ICASSP 2014, Florence ,Italy.
- **Alireza Ghasemi**, Mahdad Hosseini Kamal and Martin Vetterli: *Computationally Efficient Background Subtraction in the Light Field Domain*. IS&T/SPIE Electronic Imaging 2014, San Francisco. California, USA, February 2-6, 2014.
- **Alireza Ghasemi**, Nelly Afonso and Martin Vetterli: *LCAV-31: A Dataset for Light Field Object Recognition*. IS&T/SPIE Electronic Imaging 2014, San Francisco. California, USA, February 2-6, 2014.
- **Alireza Ghasemi** and Martin Vetterli,: *Scale-Invariant Representation of Light Field Images for Object Recognition and Tracking*. IS&T/SPIE Electronic Imaging 2014, San Francisco. California, USA, February 2-6, 2014.
- Claudiu Cristian Musat, **Alireza Ghasemi**, Boi Faltings:*Sentiment Analysis Using a Novel Human Computation Game*. ACL 2012 People's Web Meets NLP Workshop, 2012.
- **Alireza Ghasemi**, Hamid R. Rabiee, Mohammad T. Manzuri, Mohammad H. Rohban: *A Bayesian Approach to the Data Description Problem*. AAAI Twenty-Sixth Conference on Artificial Intelligence (AAAI-12), 2012
- Amirhossein Tavanaei, **Alireza Ghasemi**, Mohammad Tavanaei, Hossein Sameti, Mohammad T. Manzuri:*Support Vector Data Description for Spoken Digit Recognition*. International Conference on Bio-inspired Systems and Signal Processing (BIOSIGNALS 2012), 2012:32-37.
- **Alireza Ghasemi**, Hamid R. Rabiee, Mohsen Fadaee, Mohammad T. Manzuri, Mohammad H. Rohban: *Active Learning from Positive and Unlabeled Data*. IEEE ICDM 2011 Workshop on Optimization Based Methods for Emerging Data Mining Problems (OEDM'11), 2011:244-250.
- **Alireza Ghasemi**, Mohammad T. Manzuri, Hamid R. Rabiee, Mohammad H. Rohban, Siavash Haghiri:*Active One-Class Learning by Kernel Density Estimation*. IEEE International Workshop on Machine Learning for Signal Processing (MLSP'11), 2011:1-6.

Reports and Theses

- *Feature Identification and Tracking in the Plenoptic Space*, Candidacy Report for the Doctoral Program in Computer and Communication Systems, Under Supervision of Prof. Martin Vetterli, Summer 2012.
- *Content-Based Image Retrieval Using Relevance Feedback and Semi-Supervised Learning*, M. Sc. Thesis, Under Supervision of Dr. Mohammad Taghi Manzuri, Summer 2011.
- *A Survey on Website Classification Methods with Introduction to a New Method Based on Internal PageRanks*, B.Sc. Thesis, Under Supervision of Dr. Hassan Abolhassani, Summer 2009.

Poster Presentations

- **Alireza Ghasemi**, Julien Lalande, Laurent Rime, Martin Vetterli, *Light-Field/Plenoptic Image Processing - Principles*. Research Day of the EPFL School of Computer and Communication Sciences, June 2014.
- **Alireza Ghasemi**, Julien Lalande, Laurent Rime, Martin Vetterli, *Light-Field/Plenoptic Image Processing - Applications*. Research Day of the EPFL School of Computer and Communication

Sciences, June 2014.

Selected Passed Courses

Doctoral School

- **Candidacy Requirement Course:** Foundations of Imaging Sciences(6.0)
- **Optional Courses:** Convex Optimization(5.5), Statistical Signal Processing(5.5)

Graduate School

- **Fundamentals:** Image Processing(19.2), Stochastic Processes(19), Speech Processing(19)
- **Machine Learning:** Machine Learning(19.2), Pattern Recognition(19.5), Human and Computer Vision(20)
- **Soft Computing:** Neural Networks and Fuzzy Systems(20), Computational Intelligence(18.9)

Undergraduate

- **Basic Courses:** Advanced Programming(20), Discrete Structures(18.5), Electric Circuits(20)
- **Mathematics:** Probability and Statistics(17.5), Numerical Methods(19), Computer Simulation(19.5), Engineering Mathematics(16.8)
- **Computer Science and Systems:** Theory of Machines and Languages(17.8), Computer Networks(19.2), Network Security(18.3), Compiler Design(20), Programming Languages (20)
- **Software Engineering:** Database Systems(18.5), Object-Oriented Design (18.8), System Analysis and Design(20), Software Engineering(19)
- **Artificial Intelligence:** Artificial Intelligence(20), Signals and Systems (20), Information Retrieval(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/C++: Experiences with OpenCV and STL.

Web Development: Experiences in Symfony, Spring, Struts2, GWT, Grails, etc.

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

Python: Experiences in Blender scripting, NumPy and SciPy.

Typesetting: Fluent in LaTeX.

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

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.*

Selected Honors and Awards

Doctoral Fellowship from the I&C School of EPFL   **Lausanne, Switzerland**
Granted full one-year fellowship to start PhD.   *Fall 2011*

Rank 1st in the Artificial Intelligence section of the Sharif University   **Tehran, Iran**
Ranked by GPA.   *Summer 2011*

Rank 1st in the nationwide graduate entrance exam in IT engineering   **Tehran, Iran**
Among more than 17,000 students.   *Summer 2009*

Rank 183rd (top %0.06) in the nationwide university entrance exam   **Tehran, Iran**
Among more than 300,000 students in the Mathematics branch.   *Summer 2005*

Interests

Reading: Literature, History, Technology. Gaining general knowledge through reading about different topics of interest from historical analyses to technology reviews

References

Available upon request