OLA AHMAD Curriculm Vitæ

Last updated: Nov. 16, 2016

Ph.D., Eng. Holding French citizen and Canadian permanent residence

CONTACT INFORMATION

Laboratoire d'Imagerie et de Vision 4D (LIV4D)
Département de génie informatique et génie logiciel
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EDUCATION

2010-2013 **Doctor of science, Image & signal processing**
Ecole Nationale Supérieure des Mines (ENSM-ST), Saint-Etienne, France. **Thesis title:** Stochastic representation and analysis of rough surface topography by random fields and integral geometry–Application to the UHMWPE cup involved in total hip arthroplasty
Supervisor: Professor Jean-Charles Pinoli
Thesis defended on Sep. 23, 2013

2009-2010 **Master of science, Image & signal processing**
Université de Jean-Monnet, Saint-Etienne, France.

1997-2002 **Engineering diploma, Electrical engineering and computer science**
High Institute of Applied Science and Technology (HIAST), Damascus, Syria.

RESEARCH INTERESTS

- Random fields and geometry, differential and integral geometry.
- Detection theory, change detection, pattern recognition.
- Statistical image processing, machine learning, computational statistics.
- Space-time and multi-scale modeling, geometric shape analysis.
- Applications: remote sensing, medical image analysis, biological image analysis, image acquisition (e.g., white light interferometer, optical triangulation, AFM, etc.).

RESEARCH EXPERIENCE

Jan 2016 – Now
Postdoctoral researcher (Canada),
LIV4D (Laboratoire d'Imagerie et de Vision 4D), École Polytéchnique de Montréal, Canada, with Prof. Farida Cheriet **Project title:** Spatio-temporal statistical analysis of 3D Trunk surface deformation for non-invasive prediction of scoliosis progression. Research project in collaboration with CHU Sainte-Justine de Montréal, with Dr. Hubert Labelle.

Jul 2015 – Dec 2015
Postdoctoral researcher (Canada), 6 months postdoc fellowship,
IntRoLab (Laboratoire de robotique intelligente, interactive, intégrée, interdisciplinaire), 3IT, université de Sherbrooke, Sherbrooke, Canada, with Prof. Wael Suleiman. **Project title:** 3D mapping of crowded environment for robotic grasp recognition of unknown objects.

Nov 2013 – Jun 2015
Postdoctoral researcher (France), 18 months Postdoc fellowship,
iCube (Laboratoire des sciences de l'ingénieur, de l'informatique et de l'imagerie) UMR 7357, université de Strasbourg, France, with Prof. Christophe Collet.
Project 1: Change detection in high-resolution multi-temporal remotely sensed images.
Project 2: Statistical image processing for growing bacteria detection and classification. ***Industry-partnered collaborative research with Merck Millipore company (Molsheim).***

Oct 2010 – Nov 2013
Research assistant (France), 3 years doctoral level,
LGF (Laboratoire Georges Friedel), UMR 5307 ENSM-ST, Saint-Etienne, France, with Prof. Jean-Charles Pinoli. **Ph.D. topic:** Stochastic representation and analysis of rough surface topography by random fields and integral geometry with application to total hip arthroplasty.

Avr 2009 – Sep 2010
Research assistant (France), 6 months master's research internship,
LGF (Laboratoire Georges Friedel), UMR 5307 ENSM-ST, Saint-Etienne, France, with Prof. Jean-Charles Pinoli. **Project title:** Detection and characterization of anisotropic aggregated and overlapped particles by image analysis and mathematical morphology.

PUBLICATIONS

I. Articles published or accepted in refereed journals

[1]. **Ola Ahmad**, and Christophe Collet. Scale-space spatio-temporal random fields: Application to the detection of growing microbial patterns from surface roughness. *Pattern Recognition*, 58: 27-38, 2016. *[DOI-link]*

[2]. **Ola Ahmad**, and Jean-Charles Pinoli. Lipschitz-Killing Curvatures of the Excursion Sets of Skew Student's t Random Fields. *Stochastic Models*, 29 (2): 273-289, 2013. *[DOI-link]*

[3]. **Ola Ahmad**, and Jean-Charles Pinoli. On the linear combination of the Gaussian and student's t random field and the integral geometry of its excursion sets. *Statistics & Probability Letters*, 83 (2): 559-567, 2013. *[DOI-link]*

[4]. **Ola Ahmad**, Johan Debayle, Nesrine Gherras, Benoît Presles, Gilles Févotte, and Jean-Charles Pinoli. Quantification of overlapping polygonal-shaped particles based on a new segmentation method of in situ images during crystallization. *J. Electron. Imaging*, 21 (2): 021115-1-021115-11, 2012. *[DOI-link]*

[5]. **Ola Ahmad**, Johan Debayle, and Jean-Charles Pinoli. A geometric-based method for recognizing overlapping polygonal-shaped and semi-transparent particles in gray tone images. *Pattern Recognition Letters*, 32(15): 2068-2079, 2011. *[DOI-link]*

II. PhD

[6]. **Ola Ahmad**. *Stochastic representation and analysis of rough surface topography by random fields and integral geometry – Application to the UHMWPE cup involved in total hip arthroplasty*, PhdThesis, Ecole Nationale Supérieure des Mines de Saint-Etienne, Sept. 2013. *[tel-00905519]*

III. Book chapters

[7]. Yann Gavet, **Ola Ahmad**, and Jean-Charles Pinoli. Integral Geometry of Linearly Combined Gaussian and Student-t, and Skew Student's t Random Fields. *Geometric Science of Information,* Edited by Springer, 8085: 449-456, 2013. *[DOI-link]*

IV. Articles in refereed international conferences (published)

[8]. **Ola Ahmad**, Herve Lombaert, Stefan Parent, Hubert Labelle, Jean Dansereau, and Farida Cheriet. Longitudinal Scoliotic Trunk Analysis via Spectral Representation and Statistical Analysis. *In: MICCAI Workshop on Spectral and Shape Analysis in Medical Imaging (SESAMI).* Athens, Greece, Oct 17-21, 2016.

[9]. **Ola Ahmad**, Christophe Collet, and Fabien Salzenstein. Spatio-spectral Gaussian random field modeling approach for target detection on hyperspectral data obtained in very low SNR. *In 22th IEEE International Conference on Image Processing (ICIP).* Quebec city, Canada, Sep 27-30, 2015. *[DOI-link]*

[10]. **Ola Ahmad**, Yann Gavet, Jean Geringer, and Jean-Charles Pinoli. Roughness variability estimation of microscopic surfaces during engineering wear process– Application to total hip implant. *In 11th International Conference on Quality Control by Artificial Vision.* Fukuoka, Japan, May 30-Jun 1, 2013.

[11]. **Ola Ahmad**, and Jean-Charles Pinoli. Lipschitz-Killing Curvatures of the Excursion Sets of Skew Student's t Random Fields. *In Proceedings of 2nd Annual International Conference on Computational Mathematics, Computational Geometry & Statistics.* Singapore, Feb 4-5, 2013.

[12]. **Ola Ahmad**, and Jean-Charles Pinoli. On the linear combination of the Gaussian and student's t random field and the integral geometry of its excursion sets. *In Proceedings of the World Congress on Engineering and Computer Science.* San Francisco, USA, Oct 24-26, 2012.

[13]. **Ola Ahmad**, Johan Debayle, Nesrine Gherras, Benoît Presles, Gilles Févotte, and Jean-Charles Pinoli. Recognizing overlapped particles during a crystallization process from in situ video images for measuring their size distributions. *In the 10th SPIE International Conference on Quality Control by Artificial Vision.* Saint-Etienne, France, Jun 28-30, 2012.

V. Articles in refereed national conferences (published)

[14]. **Ola Ahmad**, Johan Debayle, Nesrine Gherras, Benoît Presles, Gilles Févotte, and Jean-Charles Pinoli. Mesure de la distribution granulométrique de cristaux aciculaires par analyse d'images acquises á l'aide d'une sonde vidéo in situ. *En XIIIéme congrés de la Société Française de Génie des Procédés.* Lille, France, Nov 29-Dec 1, 2011.

VI. Patents and copyrights submitted

[15]. **Ola Ahmad**, Luc Felden, Marine Bouthillon and Christophe Collet. *A Method for Early Detection and Identification of Microbial-Colonies, apparatus for performing the method and computer program.* Patent pending: P15/189, Sep 18, 2015.

VII. Other scientific contributions

[16]. **Ola Ahmad**, Yann Gavet, Jean Geringer, Frédéric Farizon et Jean Charles Pinoli. *Caractérisation, modélisation et simulation morphologiques par géométrie intégrale*

et champs aléatoires de surfaces microstructurées. Poster at the 11e journée technique "Innovez dans les implants orthopédiques", Saint-Etienne, France, Jun 14, 2012.

[17]. **Ola Ahmad**, Nesrine Gherras, Johan Debayle, Benoît Presles, Gilles Févotte, and Jean-Charles Pinoli. *Recognizing overlapped particles during a crystallization process from in situ video images for measuring their size distributions.* Poster at the 18th International Symposium on Industrial Crystallization (ISIC), Zurich, Switzerland, Sep. 13-16, 2011.

TEACHING EXPERIENCE

During my Ph.D. at ENSM-ST, Saint-Etienne (France), I had the opportunity to participate in the following teaching activities:

2010–2013 **Digital signal processing**
Teaching assistant: conducting ∼50 hours of tutorial classes for 50 engineering students at undergraduate level (1st year).

2011–2012 **C++ programming**
Teaching assistant: conducting 15 hours of practical exercises in C++ under Linux for 50 engineering students at undergraduate level (1st year).

2010–2012 **Image processing**
Teaching assistant: conducting 18 hours of tutorial classes for 25 engineering students at undergraduate level (2ed year).

PROFESSIONAL EXPERIENCE

2002–2009 **Engineer**, department of electrical engineering and computer science, NCSRD (National Center of Scientific Research for Defense), Damascus, Syria. My professional role is to carry out research and development activities in image and video processing for real time tracking, motion analysis, and many other computer vision applications.

18 months Experience with Merck Millipore industry in statistical image processing, Strasbourg, France.

8+ years Research experience covering broad computer vision topics.

LEADERSHIP INVOLVEMENTS & COMMUNICATIONS

- **J. Peer reviewer:** Pattern Recognition, IEEE Transactions in Image Processing, and the International Journal of Earth & Environmental Science.

- **Conf. Reviewer:** 10th International Conference on Quality Control by Artificial Vision, QCAV-2011.
- **Principal supervisor** of **Ali Ahmad**, a research master internship student (6 months completed), speciality image & signal processing at the université d'Angers, France (2015). **Research project:** Analyse de séries temporelles d'images multibandes et hyperbandes : stratégies de détection d'objets diffus.
- **Co-supervisor** of **Juan Núnez**, a research master internship student (6 months completed), speciality applied mathematics, ENSM-ST, France, 2012. **Research project:** Modélisation et simulation morphologiques des surfaces par approches multi-échelles et probabilistes.
- **Good communication skills** at academic and industrial levels (meetings, brainstorming, troubleshooting, etc.).

TECHNICAL SKILLES

- Programming languages: Python, C/C++, Matlab, CBuilder, Delphi, Html.
- Operating systems: Unix, Linux, MacOSX, Windows.
- Office: LaTeX, Beamer, Open Office, Word, Excelle, Photoshop, Powerpoint.

AWARDS, FELLOWSHIPS AND RECOGNITIONS

- **Reviewer recognition** from the journal of **Pattern Recognition** awarded April, 2016.
- **Best Student paper award** from the International Conference on Computational Mathematics, Computational Geometry & Statistics, Singapore, February 4-5, 2013
- 12 months post doctoral fellowship (Jan 2016 - Jan 2017) awarded by Research Center of the Sainte-Justine university hospital, Montréal, Canada.
- 6 months post doctoral fellowship (Jul 2015 - Dec 2015) awarded by Sherbrooke university, Sherbrooke, Canada.
- 20 months post doctoral fellowship (Nov 2013 - Jun 2015) awarded in part by the French ministry for higher education and research and in part by Merck Millipore industry.

LANGUAGES

- French: Good spoken and written.
- English: Very good spoken and written.
- Arabic: Native tongue.