Ola Ahmad

✉ olasahmad@gmail.com

☎+33 6 09 37 77 05

🌐 http://icube-miv.unistra.fr/en/index.php/Ola_Ahmad

ICube CNRS laboratory, UMR 7357
University of Strasbourg,
300 bd Sébastien Brant, BP 10413 - F 67412,
Illkirch Cedex, France

CITIZENSHIP

Canadian permanent resident, and French citizen.

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**
Jean-Monnet university, Saint-Etienne, France.

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

RESEARCH INTERESTS

I'm interested in image & signal processing and in computer vision using mathematical modelling
based on probabilistic and statistical approaches, with current focus on :

- Image de-noising.

- Detection theory (e.g., object and change detection).

- Statistical analysis and stochastic modelling of microstructural/microtextural images.

- Image segmentation, classification and pattern recognition.

- Multi-scale and space-time modelling.

- Applications: multi/hyperspectral imaging, 3D surface imaging (e.g., white light interferometer, optical triangulation, AFM), multidimensional imaging.

TEACHING INTERESTS

- Signal processing.

- Image processing.

- Stochastic and integral geometry.

- Probability theory and statistics.

PUBLICATIONS

– International referred journals

1. O. Ahmad, J. Debayle, and J.-C. Pinoli. "A geometric-based method for recognizing overlapping polygonal-shaped and semi-transparent particles in gray tone images", *Pattern Recognition Letters*, Vol. 32, 15, pp. 2068-2079, November 2011.

2. O. Ahmad, J. Debayle, N. Gherras, B. Presles, G. Févotte, and J.-C. Pinoli. "Quantification of overlapping polygonal-shaped particles based on a new segmentation method of in situ images during crystallization.", *Journal of Electronic Imaging*, Vol. 21, 2, pp. 021115-(1-11), March 2012.

3. O. Ahmad and J.-C. 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*, Vol. 83, 2, pp. 559-567, February 2013.

4. O. Ahmad and J.-C. Pinoli. "Lipschitz-Killing Curvatures of the Excursion Sets of Skew Student's t Random Fields.", *Stochastic Models*, Vol. 29, 2, pp. 273-289, May 2013.

– PhD Thesis

5. O. Ahmad. "Stochastic representation and analysis of rough surface topography". *LAP LAMBERT Academic Publishing*, pp 168, 2013.

– Book chapter

6. Y. Gavet, Ola. Ahmad and J.-C. Pinoli. "Integral geometry of linearly combined Gaussian and Student's t, and skew-student's t random fields". *In First International Conference on Geometric Science of Information (GSI2013)*, Lecture notes in Computer Science, Springer Berlin Heidelberg, 8085, pp 449-456, Paris, France, August 28-30, 2013.

– International conferences and proceedings

7. O. Ahmad, J. Debayle, N. Gherras, B. Presles, G. Févotte, and J.-C. Pinoli. "Recognizing overlapped particles during a crystallization process from in situ video images for measuring their size distributions.", *In 10th SPIE International Conference on Quality Control by Artificial Vision (QCAV)*, Saint-Etienne, France, June 28-30, 2011.

8. O. Ahmad, N. Gherras, J. Debayle, B. Presles, G. Fevotte, and J.-C. Pinoli. "Recognizing overlapped particles during a crystallization process from in situ video images for measuring their size distributions.", *In 18th International Symposium on Industrial Crystallization (ISIC)*, Zurich, Switzerland, September 12-17, 2011.

9. O. Ahmad, J. Debayle, N. Gherras, G. Fevotte, and J.-C. Pinoli. "Mesure de la distribution granulométrique de cristaux aciculaires par analyse d'images acquises à l'aide d'une sonde vidéo in situ.", *En XIIIème congrès de la Société Française de Génie des Procédés (SFGP)*, Lille, France, November 29 - December 1, 2011.

10. O. Ahmad and J.-C. 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 (WCECS2012)*, San Francisco, USA, 2012, October 24-26, 2012.

11. O. Ahmad and J.-C. Pinoli. "Lipschitz-Killing Curvatures of the Excursion Sets of Skew Student-t Random Fields", *Proceedings of 2nd Annual International Conference on Computational Mathematics, Computational Geometry & Statistics*, Singapore, February 4-5, 2013.

12. O. Ahmad, Y. Gavet, J. Geringer and J.-C. 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 (QCAV)*, Fukuoka, JAPAN, May 30 - Jun 1, 2013.

— **Submitted and preprint papers**

13. O. Ahmad, C. Collet, M. Bouthillon, and Y. Takakura. (2015). "Automatic early detection of microbiological contamination from topographic surface roughness using random field modeling." Paper submitted for publication in refereed journal.

14. O. Ahmad, and C. Collet. (2015). "Scale-space spatio-temporal random fields: Application to detection of microbial patterns from noisy images." Paper submitted for publication in refereed journal.

15. O. Ahmad, C. Collet, and Fabien Salzenstein. (2015 January). "Spatio-spectral Gaussian random field modeling approach for target detection on hyperspectral data obtained in very low SNR." Conference paper submitted to IEEE ICIP-2015.

— **Patent paper in preparation with Merck Millipore industriel partner.**

RESEARCH EXPERIENCE

Nov. 2014 to present	**Research assistant**, Post-doctoral fellowship
	ICube CNRS laboratory, Imaging, robotics, remote sensing and biomedical department, university of Strasbourg, Strasbourg, France.
	Project title: Image analysis for temporal change detection in high frequency remote sensing sequences – Application to multi/hyperspectral images.
	Supervisor: Professor Christophe Collet (Team leader of Model-Image-Vision research group: `http://miv.u-strasbg.fr/collet/Perso/ColletPerso.htm`).

Sep. 2013– Nov. 2014	**Research assistant**, Post-doctoral fellowship
	ICube CNRS laboratory, Imaging, robotics, remote sensing and biomedical department, university of Strasbourg, Strasbourg, France.
	Collaborative research with Merck Millipore industrial company in microbiological techniques and methods.
	Project title: Statistical image processing for growing bacteria detection and classification.
	Supervisor: Professor Christophe Collet.

2010-2013	**Research assistant**, Doctoral level
	Center for biomedical and healthcare engineering, Ecole Nationale Supérieure des Mines, Saint-Etienne, France.
	Thesis project: Stochastic representation and analysis of rough surface topography by random fields and integral geometry.
	supervisor: Professor Jean-Charles Pinoli.

Avr. 2009– Sep. 2010	**Research assistant**, Master's level
	Center for biomedical and healthcare engineering, Ecole Nationale Supérieure des Mines, Saint-Etienne, France.
	Master project: Detection and characterization of anisotropic aggregated and overlapped particles by image analysis and mathematical morphology.
	Supervisor: Professor Jean-Charles Pinoli.

TEACHING EXPERIENCE

2010–2013	**Digital signal processing**
	Teaching assistant: prepared and conducted 50 hours of tutorials and practical exercises for classes of 50 students at Ecole Nationale Supérieure des Mines de Saint-Etienne, France.

2011–2012   **C++**
Conducting 23 hours of practical exercises in C++ under Linux for classes of 50 students at Ecole Nationale Supérieure des Mines de Saint-Etienne, France.

2010–2012   **Image processing**
Teaching assistant: prepared and conducted 50 hours of tutorials and practical exercises for classes of 50 students at Ecole Nationale Supérieure des Mines de Saint-Etienne, France.

2008–2009   **Pattern recognition & machine leaning**
Teaching assistant: prepared and conducted weekly tutorials and practical exercises for a class of 25 undergraduate students at High Institute of Applied Science and Technology, Syria.

PROFESSIONAL EXPERIENCE

2002–2009   **Engineer**, Defence ministry, Damascus, Syria.
Developing image processing algorithms for real time applications focused on tracking, object detection, pattern recognition, image enhancement and de-noising, image registration, and video processing on embedded systems.

ACADEMIC COMMUNITY INVOLVEMENT

- **Co-supervisor**, postgraduate research student in master of science, image & signale processing, university of Strasbourg, France. Mars 2015-present.
Research project: Analyse de séries temporelles d'images multibandes et hyperbandes : stratégies de détection d'objets diffus.

- **Co-supervisor**, postgraduate research student in master of science, applied mathematics, Ecole Nationale Supérieure des Mines, France. Mars 2012-Septembre 2012.
Research project: Modélisation et caractérisation multi-échelles de surfaces par champs aléatoires et géométrie intégrale.

- **Technical reviewer**, 10th International Conference on Quality Control by Artificial Vision, QCAV-2011

HONOURS AND AWARDS

- **Paper awards:** Best Student paper from the International Conference on Computational Mathematics, Computational Geometry & Statistics, Singapore, February 4-5, 2013

TECHNICAL SKILLES

- **Programming languages:** Python, C/C++, CBuilder, Visual C, Delphi, Html.

- **Operating systems:** Unix, Linux, MacOSX, Windows.

- **Software:** Matlab, R, Envis.

- **Office: LaTeX, Beamer, Open Office, Word, Excelle, Photoshop, Powerpoint.**

LANGUAGES
Fluent in French and English (spoken and written).

REFERENCES
Christophe COLLET
Professor and MIV-Team leader
Laboratoire iCube, université de Strasbourg - CNRS UMR 7357
300 Bd S. Brant BP 10413-F 67412 ILLKIRCH Cedex, France
E-mail : c.collet@unistra.fr
Tél: +33(0)-3-68-85-44-90

Jean-Charles PINOLI
professor
Laboratoire LGF, ENSMSE - CNRS UMR 5307
Ecole Nationale Supérieure des Mines de Saint-Etienne
158 cours Fauriel, 42023 Saint-Etienne cedex 02, France
E-mail : pinoli@emse.fr
Tél: +33(0)-4-77-42-66-74

Johan DEBAYLE
Associate professor
Laboratoire LGF, ENSMSE - CNRS UMR 5307
Ecole Nationale Supérieure des Mines de Saint-Etienne
158 cours Fauriel, 42023 Saint-Etienne cedex 02, France
E-mail : debayle@emse.fr
Tél: +33(0)-4-77-42-02-19

Yann GAVET
Associate professor
Laboratoire LGF, ENSMSE - CNRS UMR 5307
Ecole Nationale Supérieure des Mines de Saint-Etienne
158 cours Fauriel, 42023 Saint-Etienne cedex 02, France
E-mail : gavet@emse.fr
Tél: +33(0)-4-77-42-01-70

Jean GERINGER
Associate professor
Laboratoire LGF, ENSMSE - CNRS UMR 5307
Ecole Nationale Supérieure des Mines de Saint-Etienne

158 cours Fauriel, 42023 Saint-Etienne cedex 02, France

E-mail : geringer@emse.fr

Tél: +33(0)-4-77-42-66-88