

# YAN AZDOUD, Ph.D.

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Tel (USA) +1 (443) 240 8318

French citizenship

1807 Saint Paul Street,  
21202 Baltimore, Maryland

## Experience

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**Postdoctoral researcher, CMRL, civil eng. dept., Johns Hopkins University, Baltimore, MD, USA**

Feb 2014-Present

*Task:* Adaptive enrichment of the Crystal Plasticity Finite Element Model (CPFEM)

*Principal Investigator:* Prof. Somnath Ghosh

*Skills:* Finite deformation, wavelet decomposition, hierarchical FEM, crystal plasticity

**Doctoral student researcher, COHMAS, KAUST, Saudi Arabia**

2010-2014

*Thesis title:* A hybrid local/nonlocal framework for the simulation of damage and fracture

*Advisor:* Prof. Gilles Lubineau

*Skills:* Development under C++ and OpenMP, non-local mechanics, damage mechanics, fracture mechanics, coupling methods

**Research intern, Sandia National Lab at Albuquerque NM, USA**

Summer 2011

*Task:* Development of composite models on EMU

*Advisor:* Dr. Stewart Silling

*Skills:* Development under FORTRAN and MPI, non-local mechanics, damage mechanics, laminated composite theory

**Graduate student researcher, LMT Cachan, France**

Spring 2010

*Thesis title:* Two optimization algorithms by multi-time-stepping for explicit dynamic simulations

*Advisor:* Prof. Christian Rey

*Skills:* Domain decomposition, multi-time stepping, 2D FEM solution in MATLAB

**Research intern, Department of Mechanical Engineering, UC Berkeley, CA, USA**

Summer 2009

*Task:* Simulation of embed SiC sensor in composite structures

*Advisor:* Prof. Debbie Senesky

*Skills:* Simulation in Abaqus, stress criteria in anisotropic models

## Education

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**Ph. D.** in Mechanical Engineering, King Abdullah University of Science and Technology (KAUST), Saudi Arabia

Graduated in Feb 2014

**M. S.** in Mechanical Engineering, Advanced Techniques in Structure Calculus (TACS), ENS de Cachan

Graduated in 2010

**B. S.** in Mechanical Engineering, ENS de Cachan, France

Graduated in 2008

*Classe Préparatoire*, Lycée Saint-Louis, Paris, France

2005-2007

*Baccalauréat*, French high school equivalent, El Jadida, Morocco

Completed in 2005

## **Skills**

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### **Mechanical engineering**

#### **Theoretical skills**

Computational mechanics, local continuum mechanics, atomistic, non-local fracture, non-linear solver, advanced FEM, Peridynamics, damage mechanics, fracture theory, dynamic simulation, laminate theory, XFEM/GFEM, homogenization methods, coupling methods, inverse methods, finite deformation, crystal plasticity, DG/FEM, CAD-CAM

#### **Experimental skills**

Preparation of composite laminate (vacuum infusion, molding, curing and post-curing), metal casting and working, long distance microscopy, indentation test, traction and micro-traction test, image correlation, basic knowledge in numerical control for multiaxis machining and rapid prototyping

### **Languages**

Fluent in French and English, conversational in Spanish and Arabic

### **Programming**

**Languages:** C, C++, FORTRAN, HTML/CSS, Javascript, MATLAB

**Libraries:** OpenMP, MPI, Cuda, OpenGL shaders, Qt, JQuery, Nodejs

### **Software**

**OS:** Windows, Mac, Linux

**Engineering:** Comsol Multiphysics, Abaqus, MATLAB, Cast3m, Freefem, CATIA, Mathematica, EMU, Tecplot

**General:** Latex, Adobe Illustrator, Photoshop, Premiere, Windows and Open office

## **Conferences and publications**

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### **Peer reviewed publications: 58 citations excluding self and co-authors, Google scholar**

F. Han, G. Lubineau, **Y. Azzoud**, *Adaptive coupling between damage mechanics and peridynamics: a route for objective simulation of material degradation up to complete failure*, Journal of the Mechanics and Physics of Solids, (2016)

F Han, G. Lubineau, **Y. Azzoud**, A. Askari, *A morphing approach to couple state-based peridynamics with classical continuum mechanics*, Computer Methods in Applied Mechanics and Engineering, (2016)

**Y. Azzoud**, F. Han, G. Lubineau, *The morphing method as a flexible tool for adaptive local/non-local simulation of fracture*, Computational mechanics, Vol 54, 711-722, (2014)

F. Han, **Y. Azzoud**, G. Lubineau, *Computational modeling of elastic properties of carbon nanotube/polymer composites with interphase regions. Part I: Microstructural characterization and geometric modeling*, Computational Materials Science, Vol 81, 641-651, (2014)

F. Han, **Y. Azzoud**, G. Lubineau, *Computational modeling of elastic properties of carbon nanotube/polymer composites with interphase regions. Part II: Mechanical modeling*, Computational Materials Science, Vol 81, 652-661, (2014)

**Y.Azzoud**, F. Han, G. Lubineau, *A morphing framework to couple non-local and local anisotropic continua*,

International Journal of Solids and Structures, Vol 50, **9**, 1332-1341, (2013)

G. Lubineau, **Y. Azzdoud**, F. Han, C. Rey and A. Askari, *A morphing strategy to couple local to non-local continuum mechanics*, Journal of the Mechanics and Physics of Solids, Vol 60, **6**, 1088-1102, (2012)

### **In preparation**

**Y. Azzdoud**, J. Cheng, S. Ghosh, *Wavelet Enhanced Adaptive Hierarchical Finite Element Model for Polycrystalline Microstructures*, **under preparation**

**Y. Azzdoud**, J. Cheng, S. Ghosh, *Adaptive Wavelet Enhancement for Finite Deformation Generalized Crystal Plasticity Finite Element Method*, **under preparation**

### **Book chapters**

A. Askari, **Y. Azzdoud**, F. Han, G. Lubineau, S. Silling, *Peridynamics for analysis of failure in advanced composite materials*, Chapter 19 (12), **Numerical Modelling of Failure in Advanced Composite Materials**, Woodhead Publishing (2015)

**Y. Azzdoud**, F. Han, D. Littlewood, G. Lubineau and P. Seleson, *Coupling Local and Nonlocal Models*, Chapter 17, **Handbook of Peridynamic Modeling**, Chapman and Hall/CRC, **expected 2016**

### **Conferences and workshops**

**Y. Azzdoud**, J. Cheng, S. Ghosh, *The Adaptive Wavelet Enhancement for Crystal Plastic Finite Element Method*, 13<sup>th</sup> US National Congress on Computational Mechanics, San Diego, CA (2015)

S. Ghosh, **Y. Azzdoud**, *Advancing Computational Methods for Image-based Modeling of Polycrystalline Metallic Material*, AFOSR 2015 Multiscale Structural Mechanics Annual Grantees Meeting, Fort Walton, FL (2015)

S. Ghosh, **Y. Azzdoud**, *Advancing Computational Methods for Image-based Modeling of Polycrystalline Metallic Material*, AFOSR 2014 Multiscale Structural Mechanics Annual Grantees Meeting, Albuquerque, NM (2014)

G. Lubineau, F. Han and **Y. Azzdoud**, *How can peridynamics and damage mechanics work together to achieve objective simulation of failure?* MM&FGM 2014, Sao Paulo, Brazil (2014)

**Y. Azzdoud**, F. Han, G. Lubineau, *Adaptive coupling for the simulation of non-local static fracture*, CEMAM workshop, KAUST, Thuwal, KSA (2013)

**Y. Azzdoud**, *Multiscale Simulation of Non-Local Models*, Noor for Research, KAUST, Thuwal, KSA (2013)

**Y. Azzdoud**, F. Han, G. Lubineau, *Static fracture in non-local simulation using adaptive DGFEM*, NDF2013, San Antonio, TX, USA (2013)

**Y. Azzdoud**, G. Lubineau, F. Han, *Ghost Forces in Non-Local-to-Local Continua Coupling by the Morphing Method*, ESMC'12, Graz, Austria (2012)

G. Lubineau, **Y. Azzdoud**, F. Han, C. Rey and A. Askari, *A gradient-based coupling method between Cauchy and non-local continuum*, WCCM'12, Sao Paulo, Brazil (2012)

**Y. Azzdoud** and G. Lubineau, *A Gradient-based Coupling Method between Cauchy Continuum Model and Bond-Based Peridynamics*, CFRAC'11, Barcelona, Spain (2011)

G. Lubineau, **Y. Azzdoud**, F. Han, C. Rey and A. Askari, *A gradient-based Coupling method between*

*Cauchy and Non-local continuum*, USNCCM'11, Minneapolis, MN, USA (2011)

## **Awards, recognition and fellowship**

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KAUST Provost academic achievement award	2010-2011
KAUST Ph.D. student fellowship	2010-present
ENS <i>Normalien</i> fellowship	2007-2010

## **Additional information**

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**Sport:** Soccer, squash and natation

**Volunteering:** Instructor in KAUST for WEP, instructor in the Baltimore Station North Tool Library

**Music:** Derbuka (traditional Moroccan drum) and piano

**Hobbies:** Steel forging, gardening, photography, and astro-photography

## **References**

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**Prof. Somnath Ghosh**, Michael G. Callas Chair Professor, Department of Civil Engineering, Johns Hopkins University, Latrobe 203, 3400 N. Charles Street, Baltimore, MD 21218, USA  
sghosh20@jhu.edu

**Prof. Gilles Lubineau**, King Abdullah University of Science and Technology (KAUST), Physical Sciences and Engineering Division, COHMAS Laboratory, Thuwal 23955-6900, Saudi Arabia  
gilles.lubineau@kaust.edu.sa

**Prof. Christian Rey**, LMT Cachan (ENS Cachan / CNRS / UPMC / PRES UniverSud Paris), 61 Avenue du President Wilson, 94235 Cachan Cedex, France  
rey@lmt.ens-cachan.fr

**Dr. Stewart Silling**, Multiscale Dynamic Material Modeling Department, Sandia National Laboratories, Albuquerque, NM, USA  
sasilli@sandia.gov

**Prof. Debbie G. Senesky**, Aeronautics and Astronautics Department, Stanford University, CA, USA  
dsenesky@stanford.edu