# LUCA DI STASIO

## Postdoctoral Researcher

Discovery Boulevard, G-3900, KAUST, Thuwal, Saudi Arabia

**D-CPR Certified** **Driving License B (IT)**

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**PROFILE**

Scientific researcher and software simulation engineer, I'm a creative problem-solver and challenge-driven. Advocate of good coding practices in research to enhance repeatability and openness, I am a founder and active promoter of the Italian Carpentries community.

## EMPLOYMENT HISTORY

### KAUST — Thuwal, Saudi Arabia

Apr 2020 - Present **Postdoctoral Researcher** *(with Prof. Brian Moran)*

- Led the development of multiple research projects from idea to publication in the field of large deformation elasticity
- Developed automated software pipelines for the semi- and un-supervised generation and analysis of models
- Developed routines for the visualization of multi-dimensional data
- Disseminated results through the publication of journal articles
- Presented results at international conferences

### UNIVERSITÉ DE LORRAINE — Nancy, France

Sep 2020 – Feb 2021 **Guest Lecturer**

- Established learning objectives, formulated assessment methods and designed learning activities of a Solid Mechanics course for 2nd year undergraduate students in Materials Science and Engineering delivered online
- Delivered learning activities, provided extra-curricular support, and assessed the achievement of learning outcomes
- Managed remotely a team of 5 teaching assistants

### LULEÅ UNIVERSITY OF TECHNOLOGY — Luleå, Sweden

Jan 2018 – Dec 2019 **Early-stage Researcher** *(with Prof. Janis Varna)*

- Completed successfully an international research project between institutions in France, Sweden, and Germany with multiple stakeholders and overlapping requirements
- Developed automated software pipelines for the semi- and un-supervised generation and analysis of models
- Co-supervised master students' research projects
- Disseminated results through the publication of journal articles
- Presented results at international conferences and seminars

Jan 2018 – Dec 2019 **University Teaching Assistant**

- Delivered learning activities in the field of Experimental Composite Mechanics to 1st and 2nd year international master students in Materials Science and Engineering

### UNIVERSITÉ DE LORRAINE — Nancy, France

Sep 2016 – Dec 2017 **University Teaching Assistant**

- Delivered learning activities in the field of Experimental Mechanics, Mechanics of Materials, and Computational Mechanics of Composite Materials to 2nd and 3rd year undergraduate and 1st year graduate students

Sep 2015 – Dec 2017 **Early-stage Researcher** *(with Prof. Zoubir Ayadi)*

- Kickstarted an international research project (between institutions in France, Sweden and Germany) with multiple stakeholders and overlapping requirements
- Developed automated software pipelines for the semi- and un-supervised generation and analysis of models
- Presented results at international conferences and seminars

### ETH ZÜRICH — Zürich, Switzerland

Sep 2013 – Aug 2015 **Early-stage Researcher** *(with Prof. Hans Herrmann)*

- Participated to the development of a coupled LBM-FEM code for staggered fluid-structure interaction
- Optimized the performance of an in-house code for multi-scale modeling of wood

### IMDEA MATERIALS INSTITUTE — Madrid, Spain

Nov 2012 – Aug 2013 **Research Assistant** *(with Dr. Claudio Lopes)*

- Organized and completed successfully an international research project between institutions in Italy and Spain

## EDUCATION

| | | | |
|---|---|---|---|
| Sep 2015 – Dec 2019 | **PHD** | **POLYMERIC COMPOSITE MATERIALS** | |
| | LULEÅ UNIVERSITY OF TECHNOLOGY | | Luleå, Sweden |
| Sep 2015 – Dec 2019 | **PHD** | **MATERIALS SCIENCE** | |
| | UNIVERSITÉ DE LORRAINE | | Nancy, France |
| Nov 2013 | **PE** | **INDUSTRIAL ENGINEERING** | |
| | POLITECNICO DI MILANO | | Milano, Italy |
| Oct 2010 – Oct 2013 | **MSC** | **SPACE ENGINEERING** | **GPA 110/110** |
| | POLITECNICO DI MILANO | | Milano, Italy |
| Sep 2011 – Jun 2012 | **MSC** | **MECHANICAL ENGINEERING** | **GPA 4/4** |
| | DREXEL UNIVERSITY | | Philadelphia, USA |
| Sep 2007 – Sep 2010 | **BSC** | **AEROSPACE ENGINEERING** | **GPA 110/110** |
| | POLITECNICO DI MILANO | | Milano, Italy |

## PROFESSIONAL DEVELOPMENT (SELECTED)

| | | |
|---|---|---|
| Oct – Dec 2021 | **HIGHER EDUCATION TEACHING CERTIFICATE** | |
| | HARVARD UNIVERSITY (THROUGH HARVARDX) | USA |
| Sep – Nov 2020 | **CARPENTRIES TRAINER TRAINING** | |
| | THE CARPENTRIES | USA |
| Jun – Jul 2020 | **CARPENTRIES MAINTAINER TRAINING** | |
| | THE CARPENTRIES | USA |
| Sep 2018 – Jan 2019 | **SWEDISH QUALIFYING COURSE FOR UNIVERSITY TEACHERS** | |
| | LULEÅ UNIVERSITY OF TECHNOLOGY | Sweden |
| May – Jul 2018 | **FUNDAMENTALS OF BUSINESS CERTIFICATE** | |
| | QUANTIC SCHOOL OF BUSINESS AND TECHNOLOGY (PREVIOUSLY SMARTLY) | USA |
| Mar 2018 | **RESEARCH FUNDING** | |
| | LULEÅ UNIVERSITY OF TECHNOLOGY | Sweden |
| Jun – Sep 2017 | **CARPENTRIES INSTRUCTOR TRAINING** | |
| | THE CARPENTRIES | USA |
| Sep – Nov 2016 | **PROJECT MANAGEMENT** | |
| | ECOLE CENTRALE LILLE | France |

## COMPUTER SKILLS

C++ Python Julia Fortran R Matlab Mathematica Maple
Windows Batch Unix Shell Abaqus Ansys Comsol FEniCs OpenFOAM Thermal Desktop
SQL Git Javascript HTML CSS VBA Excel OpenMP MPI CUDA OpenACC

## LANGUAGES

| | | | |
|---|---|---|---|
| **Italian** | Native speaker | **English** | Highly proficient |
| **French** | Highly proficient | **Spanish** | Highly proficient |
| **German** | Working knowledge | **Swedish** | Working knowledge |

## PUBLICATIONS

### PEER-REVIEWED JOURNAL PUBLICATIONS

[1] Di Stasio, L., & Moran, B. (2022). Simplicity on the other side of complexity: asymptotic linearity and superposition at the tip of a Griffith crack in thin neo-Hookean sheets under large deformations. *In preparation.*

[2] Di Stasio, L., & Moran, B. (2022). Large deformations at the tip of a Barenblatt-Dugdale cohesive crack in thin neo-Hookean sheets. *In preparation.*

[3] Di Stasio, L., & Moran, B. (2022). Asymptotic and non-asymptotic solutions for cracks in thin neo-Hookean sheets with crack faces loaded by dead and live stress. *In preparation.*

[4] Di Stasio, L., & Moran, B. (2022). The Cauchy tetrahedron argument in Riemannian geometry and the definition of stress boundary conditions with dead and live loads in finite elasticity. *In preparation.*

[5] Di Stasio, L., & Moran, B. (2022). Arithmetic progression of sines and cosines and the emergence of symmetry in the elastic behavior of hydrogels. *In preparation.*

[6] Di Stasio, L., Liu, Y., & Moran, B. (2021). Large deformation near a crack tip in a fiber-reinforced neo-Hookean sheet with discrete and continuous distributions of fiber orientations. *Theoretical and Applied Fracture Mechanics, 114,* 103020. https://dx.doi.org/10.1016/j.tafmec.2021.103020

[7] Di Stasio, L., Varna, J., & Ayadi, Z. (2021). Growth of interface cracks on consecutive fibers: On the same or on the opposite sides? *Materials Today: Proceedings, 34(1),* 360-365. https://dx.doi.org/10.1016/j.matpr.2020.06.410

[8] Di Stasio, L., Varna, J., & Ayadi, Z. (2020). Effect of the proximity to the 0°/90° interface on Energy Release Rate of fiber/matrix interface crack growth in the 90°-ply of a cross-ply laminate under tensile loading. *Journal of Composite Materials, 54(21),* 3021-3034. https://dx.doi.org/10.1177/0021998320912810

[9] Di Stasio, L., & Ayadi, Z. (2019). Finite Element solution of the fiber/matrix interface crack problem: Convergence properties and mode mixity of the Virtual Crack Closure Technique. *Finite Elements in Analysis and Design, 167,* 103332. https://dx.doi.org/10.1016/j.finel.2019.103]332

[10] Di Stasio, L., Varna, J., & Ayadi, Z. (2019). Energy release rate of the fiber/matrix interface crack in UD composites under transverse loading: Effect of the fiber volume fraction and of the distance to the free surface and to non-adjacent debonds. *Theoretical and Applied Fracture Mechanics, 103,* 102251. https://dx.doi.org/10.1016/j.tafmec.2019.102251

### CONFERENCE PROCEEDINGS

[1] Di Stasio, L., Varna, J., & Ayadi, Z. (2019). Estimating the average size of fiber/matrix interface cracks in UD and cross-ply laminates. In Turon, A., Maimì, P., & Fagerström, M. (Eds.), *Proceedings of the 7th ECCOMAS Thematic Conference on the Mechanical Response of Composites (Composites 2019), Girona, Spain, September 18-20, 2019* (pp. 57-68). Retrieved from https://documentations.wiki/R9NAz/proceeding-composites-2019-v4-pdf.html

[2] Di Stasio, L., Varna, J., & Ayadi, Z. (2018). Effect of boundary conditions on microdamage initiation in thin ply composite laminates. In *Proceedings of the 18th European Conference on Composite Materials (ECCM18), Athens, Greece, June 24-28, 2018.* Retrieved from https://az659834.vo.msecnd.net/eventsairwesteuprod/production-pcoconvin-public/f02831a803b64483b250b93c1536cb00

### THESES

[1] Di Stasio, L. (2019). *Influence of microstructure on debonding at the fiber/matrix interface in fiber-reinforced polymers under tensile loading* [Doctoral dissertation, Luleå University of Technology and Université de Lorraine]. Digitala Vetenskapliga Arkivet (DiVA). http://urn.kb.se/resolve?urn=urn:nbn:se:ltu:diva-76646 Université de Lorraine thesis repository. http://docnum.univ-lorraine.fr/public/DDOC_T_2019_0229_DI_STASIO.pdf

[2] Di Stasio, L. (2013). *Experimental, analytical and numerical investigation of loading rate effects on mode I, mode II and mixed-mode I-II delamination in advanced CFRP* [Master's thesis, Politecnico di Milano]. Digital archive of PhD and post graduate theses (POLITesi). http://hdl.handle.net/10589/82983

## CONFERENCE CONTRIBUTIONS AND SEMINARS

[1] Di Stasio, L., & Moran, B. (2022, July 7). *A Dugdale-Barenblatt model for cracks in thin neo-Hookean sheets* [Conference session, oral presentation]. 11th European Solid Mechanics Conference (ESMC 2022), Galway, Ireland.

[2] Di Stasio, L. (2020, July 27). *Native scripting in Windows: the Command Prompt interface* [Conference session, oral presentation]. CarpentryCon @ Home 2020 – Growing Inclusive, Computational Communities and Leaders, online. https://youtu.be/hRYBGsCxfDY

[3] Di Stasio, L., Varna, J., & Ayadi, Z. (2019, November 6). *Towards tough self-healing thin-ply laminates – Insights from computational micromechanical modeling and high-temperature experimental investigation of onset and propagation of transverse cracking* [Seminar, oral presentation]. LTU Composites Seminars Series, Luleå, Sweden.

[4] Di Stasio, L., (2019, October 16). *Towards tough self-healing thin-ply laminates – Insights from computational micromechanical modeling and high-temperature experimental investigation of onset and propagation of transverse cracking* [Seminar, oral presentation]. Invited seminar at KTH, Department of Fiber and Polymer Technology, Stockholm, Sweden.

[5] Di Stasio, L., Varna, J., & Ayadi, Z. (2019, September 26). *Effect of microstructure on fiber/matrix interface crack growth in UD and cross-ply laminates under tensile loading* [Seminar, oral presentation]. Invited seminar at Universidad de Sevilla, ETSI, Elasticity and Strength of Materials Group, Sevilla, Spain.

[6] Di Stasio, L., Varna, J., & Ayadi, Z. (2019, September 18). *Estimating the average size of fiber/matrix interface cracks in UD and cross-ply laminates* [Conference session, oral presentation]. 7th ECCOMAS Thematic Conference on the Mechanical Response of Composites (Composites 2019), Girona, Spain.

[7] Di Stasio, L., (2019, September 17). *Ply-thickness and ply-block effect on fiber/matrix interface crack growth in cross-ply laminates under tensile loading* [Seminar, oral presentation]. Invited seminar at IMDEA Materials Institute, Madrid, Spain.

[8] Di Stasio, L., Varna, J., & Ayadi, Z. (2019, May 29). *Ply-thickness effect on fiber-matrix interface crack growth* [Conference session, oral presentation]. 9th International Conference on Composite Testing and Model Identification (CompTest2019), Luleå, Sweden.

[9] Di Stasio, L., Varna, J., & Ayadi, Z. (2019, May 8). *Growth of interface cracks on consecutive fibers: on the same or on opposite sides?* [Conference session, oral presentation]. 12th International Conference on Composite Science and Technology (ICCST/12), Sorrento, Italy.

[10] Di Stasio, L., Varna, J., & Ayadi, Z. (2019, April 26). *Investigation of scaling laws of the fiber/matrix interface crack in polymer composites through Finite Element-based micromechanical modeling* [Conference session, oral presentation]. 10th EEIGM International Conference on Advanced Materials Research, Moscow, Russia.

[11] Di Stasio, L., Varna, J., & Ayadi, Z. (2018, June 26). *Effect of Boundary Conditions on Microdamage Initiation in Thin Ply Composite Laminates* [Conference session, oral presentation]. 18th European Conference on Composite Materials (ECCM18), Athens, Greece.

[12] Di Stasio, L., Varna, J., & Ayadi, Z. (2017, September 12). *Finite Elements Solution of the Fiber-Matrix Interface Crack: Effects of Mesh Refinement and Domain Size* [Seminar, oral presentation]. DocMASE Summer School 2017, Saarbrücken, Germany.

[13] Di Stasio, L., Varna, J., & Ayadi, Z. (2017, July 5). *Micromechanical models of transverse cracking in ultra-thin Fiber-Reinforced Composite laminates* [Seminar, oral presentation]. Journée de l'équipe 304 de l'Institut Jean Lamour, Nancy, France.

[14] Di Stasio, L., Varna, J., & Ayadi, Z. (2017, April 6). *Micromechanical modeling of thin ply effects on microdamage in Fiber-Reinforced Composite laminates* [Conference session, oral presentation]. International Materials Research Meeting in the Greater Region.

[15] Di Stasio, L., Varna, J., & Ayadi, Z. (2016, May 30). *RVE-based Micromechanical Analysis of Fiber-Matrix Debonding in Thin Ply FRPC Laminates* [Seminar, oral presentation]. DocMASE Summer School 2016, Luleå, Sweden.

[16] Di Stasio, L. (2012, July 12). *Modeling complex patterns of crack propagation: branching and merging mechanisms* [Seminar, oral presentation]. Wolfram Summer School 2012, Milton, MA, USA.

## TEACHING

### COURSES

Sep 2020 – Feb 2021
**SOLID MECHANICS (IN FRENCH)**
EEIGM, UNIVERSITÉ DE LORRAINE — Nancy, France
*Main Instructor(s):* Luca Di Stasio
*TA(s):* Thomas Villemin, Zoubir Ayadi, Jean-Philippe Tinnes, Marc Ponçot, Stéphane Andre

2018 - 2019
Autum and Spring Term
**COMPOSITE MATERIALS**
LULEÅ UNIVERSITY OF TECHNOLOGY — Luleå, Sweden
*Main Instructor(s):* Liva Pupure, Janis Varna
*TA(s):* Luca Di Stasio, Hiba Ben Kahla, Nawres Al-Ramahi

2018 - 2019
Spring Term
**AEROSPACE MATERIALS**
LULEÅ UNIVERSITY OF TECHNOLOGY — Luleå, Sweden
*Main Instructor(s):* Janis Varna
*TA(s):* Luca Di Stasio, Hiba Ben Kahla, Nawres Al-Ramahi

2018 - 2019
Autum Term
**COMPOSITES: DESIGN AND NUMERICAL METHODS**
LULEÅ UNIVERSITY OF TECHNOLOGY — Luleå, Sweden
*Main Instructor(s):* Andrejs Pupurs
*TA(s):* Luca Di Stasio

2018 - 2019
Spring Term
**MECHANICS OF FIBER COMPOSITES**
LULEÅ UNIVERSITY OF TECHNOLOGY — Luleå, Sweden
*Main Instructor(s):* Liva Pupure
*TA(s):* Luca Di Stasio

Sep – Dec 2017
**COMPOSITE MATERIALS (IN FRENCH)**
EEIGM, UNIVERSITÉ DE LORRAINE — Nancy, France
*Main Instructor(s):* Yves Meshaka
*TA(s):* Luca Di Stasio

Sep – Dec 2017
**MECHANICS OF MATERIALS I (IN FRENCH)**
EEIGM, UNIVERSITÉ DE LORRAINE — Nancy, France
*Main Instructor(s):* Zoubir Ayadi
*TA(s):* Luca Di Stasio, Franck Cleymand, Eloh Komlavi

Feb – Jun 2017
**SOLID MECHANICS (IN FRENCH)**
EEIGM, UNIVERSITÉ DE LORRAINE — Nancy, France
*Main Instructor(s):* Yves Meshaka
*TA(s):* Luca Di Stasio

### LECTURES AND WORKSHOPS

2022, May 19
**INTRODUCTION TO SCIENTIFIC COMPUTING AND DATA ANALYSIS WITH NUMPY (IN ITALIAN)**
SOFTWARE SUSTAINABILITY INSTITUTE — Online
*Main Instructor(s):* Luca Di Stasio
*TA(s):* Giacomo Peru

2022, Jan 27-28/Feb 3-4
**SOFTWARE CARPENTRY WORKSHOP: INTRODUCTION TO PYTHON, SHELL AND GIT (IN ITALIAN)**
CARPENTRIES ITALIA AND ELIXIR ITALIA — Online
*Main Instructor(s):* Marco Crotti, Silvia Di Giorgio, Luca Di Stasio, Lisanna Paladin, Martino Sorbaro
*TA(s):* Giacomo Peru, Loredana Le Pera

2021, Sep 9-10/16-17

SOFTWARE CARPENTRY WORKSHOP: INTRODUCTION TO PYTHON, SHELL AND GIT (IN ITALIAN)

CARPENTRIES ITALIA AND ELIXIR ITALIA — Online

*Main Instructor(s):* Silvia Bonaiuto, Vincenza Colonna, Marco Crotti, Gianluca Damaggio, Luca Di Stasio, Loredana Le Pera, Mariano Mollo, Giuseppe Profiti, Martino Sorbaro, Allegra Via, Lisanna Paladin

2021, Mar 19/26

SOFTWARE CARPENTRY WORKSHOP: INTRODUCTION TO PYTHON, SHELL AND GIT (IN ITALIAN)

CARPENTRIES ITALIA — Online

*Main Instructor(s):* Luca Di Stasio, Giorgia Mori, Giacomo Peru, Giuseppe Profiti, Martino Sorbaro

*TA(s):* Fabrizio Donzelli, Annarita Marrano, Mosè Giordano, Loredana Le Pera

2021, Mar 3-4

THE CARPENTRIES INSTRUCTOR TRAINING WORKSHOP

THE CARPENTRIES — Online

*Main Instructor(s):* Luca Di Stasio, Jason Williams

2020, Oct 21-23

DATA CARPENTRY GENOMICS WORKSHOP

NORD UNIVERSITY — Online

*Main Instructor(s):* Luca Di Stasio, Endre Sebestyén

*TA(s):* Abdurhman Kelil Ali, Kari Haugset Alterskjær, Tadeu Fernando Nogueira

2020, Oct 14-16

DATA CARPENTRY ECOLOGY WORKSHOP

NORD UNIVERSITY — Online

*Main Instructor(s):* Luca Di Stasio, Endre Sebestyén

*TA(s):* Abdurhman Kelil Ali, Kari Haugset Alterskjær, Tadeu Fernando Nogueira

2020, June 22 – July 2

DATA CARPENTRY ECOLOGY WORKSHOP

BIOTECH PARTNERS — Online

*Main Instructor(s):* Luca Di Stasio, Rohit Goswami, Sue McClatchy, Chandra Sarkar, Sayane Shome

2020, January 9-10

SOFTWARE CARPENTRY/LIBRARY CARPENTRY WORKSHOP: INTRODUCTION TO PYTHON

KING'S COLLEGE LONDON — London, UK

*Main Instructor(s):* Luca Di Stasio

*TA(s):* Stefania Marcotti, Walter Muruez Gutierrez, Neil Jakeman, Alessia Visconti, Natasha Romanova, Fiona Wardle

2019, November 21-22

SOFTWARE CARPENTRY WORKSHOP: INTRODUCTION TO PYTHON, SHELL AND GIT

UNIVERSITÄT STUTTGART — Stuttgart, Germany

*Main Instructor(s):* Monah Abou Alezz, Luca Di Stasio

*TA(s):* Dorothea Iglezakis, Ralf Diestelkämper, Michael Stegmüller, Anett Seeland, Sibylle Hermann

2018, October 9-10

SOFTWARE CARPENTRY WORKSHOP: INTRODUCTION TO R, SHELL AND GIT

HPC2N, UMEÅ UNIVERSITY — Umeå, Sweden

*Main Instructor(s):* Alistair Bailey, Luca Di Stasio

*TA(s):* Birgitte Briydsö, Pedro Ojeda

## ORGANIZATION OF CONFERENCES, SEMINARS AND WORKSHOPS

| | |
|---|---|
| 2022, Jan 27-28/Feb 3-4 | SOFTWARE CARPENTRY WORKSHOP: INTRODUCTION TO PYTHON, SHELL AND GIT (IN ITALIAN) |
| 2021, Sep 9-10/16-17 | SOFTWARE CARPENTRY WORKSHOP: INTRODUCTION TO PYTHON, SHELL AND GIT (IN ITALIAN) |
| 2021, Mar 19/26 | SOFTWARE CARPENTRY WORKSHOP: INTRODUCTION TO PYTHON, SHELL AND GIT (IN ITALIAN) |
| 2019, May 27-29 | 9TH INTERNATIONAL CONFERENCE ON COMPOSITE TESTING AND MODEL IDENTIFICATION (COMPTEST 2019) |

## SCHOLARLY PEER REVIEW

- JOURNAL OF COMPOSITE MATERIALS
- JOURNAL OF OPEN RESEARCH SOFTWARE
- FRATTURA ED INTEGRITÀ STRUTTURALE