Francis Julian Panetta

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Appointments

Assistant Professor, University of California, Davis — July 2020-
Department of Computer Science

Postdoctoral Researcher, École Polytechnique Fédérale de Lausanne — June 2017-July 2020
School of Computer and Communication Sciences

Education

Courant Institute (New York University), New York, New York — May 2017
PhD, Computer Science

California Institute of Technology, Pasadena, California — June 2010
B.S. with Honors, Computer Science

Publications

Umbrella Meshes: Elastic Mechanisms for Freeform Shape Deployment. Yingying Ren, Uday Kusupati, **Julian Panetta**, Florin Isvoranu, Davide Pellis, Tian Chen, Mark Pauly. ACM SIGGRAPH, 2022.

Topology Optimization via Frequency Tuning of Neural Design Representations. Nikan Doosti, **Julian Panetta**, Vahid Babaei. SCF 2021.

Computational Inverse Design of Surface-based Inflatables. **Julian Panetta**, Florin Isvoranu, Tian Chen, Emmanuel Siéfert, Benoît Romain, Mark Pauly. ACM SIGGRAPH, 2021.

3D Weaving with Curved Ribbons. Yingying Ren, **Julian Panetta**, Tian Chen, Samuel Poincloux, Christopher Brandt, Alison Martin, Mark Pauly. ACM SIGGRAPH, 2021.

Bistable Auxetic Surface Structures. Tian Chen, **Julian Panetta**, Max Schnaubelt, Mark Pauly. ACM SIGGRAPH, 2021.

A Low-Parametric Rhombic Microstructure Family for Irregular Lattices. Davi Tozoni, Jeremie Dumas, Zhongshi Jiang, **Julian Panetta**, Daniele Panozzo, Denis Zorin. ACM SIGGRAPH, 2020.

X-Shells: A New Class of Deployable Beam Structures. **Julian Panetta**, Mina Konaković-Luković, Florin Isvoranu, Etienne Bouleau, and Mark Pauly. ACM SIGGRAPH, 2019.

X-Shell Pavilion: A Deployable Elastic Rod Structure. Florin Isvoranu, **Julian Panetta**, Tian Chen, Etienne Bouleau, and Mark Pauly. Proceedings of the IASS Annual Symposium 2019.

Rapid Deployment of Curved Surfaces via Programmable Auxetics. Mina Konaković-Luković, **Julian Panetta**, Keenan Crane, and Mark Pauly. ACM SIGGRAPH, 2018.

Worst-Case Stress Relief for Microstructures. **Julian Panetta**, Abtin Rahimian, and Denis Zorin. ACM SIGGRAPH, 2017.

Fine-Scale Structure Design. **Julian Panetta**, Qingnan Zhou, Luigi Malomo, Nico Pietroni, Paolo Cignoni, and Denis Zorin. Symposium For Computational Fabrication 2016 (Poster).

Elastic Textures for Additive Fabrication. **Julian Panetta**, Qingnan Zhou, Luigi Malomo, Nico Pietroni, Paolo Cignoni, and Denis Zorin. ACM SIGGRAPH, 2015.

Worst-Case Structural Analysis. Qingnan Zhou, **Julian Panetta**, and Denis Zorin. ACM SIGGRAPH, 2013.

Volumetric Basis Reduction for Global Seamless Parameterization of Meshes. **Julian Panetta**, Michael Kazhdan, and Denis Zorin, Technical Report, 2012.

Dynamic Landmarking for Surface Feature Identification and Change Detection. Kiri L. Wagstaff, **Julian Panetta**, Adnan Ansar, Ronald Greeley, Mary Pendleton Hoffer, Melissa Bunte, and Norbert Schorghofer. ACM Transactions on Intelligent Systems and Technology, May 2012.

Change Detection in Mars Orbital Images Using Dynamic Landmarking. Kiri L. Wagstaff, **Julian Panetta**, Adnan Ansar, Melissa Bunte, Ronald Greeley, Mary Pendleton Hoffer, and Norbert Schorghofer. 41st Lunar and Planetary Science Conference, March 2010.

Automatic Landmark Identification in Mars Orbital Imagery. Kiri L. Wagstaff, **Julian Panetta**, Ronald Greeley, Norbert Schorghofer, Melissa Bunte, Mary Pendleton Hoffer, and Adnan Ansar. Eos Transactions of the AGU, 89(53), Fall Meeting Supplement, Abs#P53C-1469. December 2008.

CONFERENCE AND WORKSHOP TALKS

Inflatable Structures (with Mark Pauly and Benoît Roman). GRAPHYZ Workshop in Grenoble. Oct 25, 2019.

Computational Design and Fabrication of Deployable 3D Surfaces (with Mark Pauly). Geometry Workshop in Strobl. Sep 3, 2019.

Computational Design of Robust Elastic Metamaterials and Deployable Structures. Isaac Newton Institute of Mathematical Sciences. Workshop: New Trends and Challenges in the Mathematics of Optimal Design. June 13, 2019.

Rapidly Deployable Elastic Gridshells. Dagstuhl Seminar: Computational Aspects of Fabrication. Oct 25, 2018.

Minimal Worst-Case Stress Microstructure Design. World Congress on Computational Mechanics. Symposium: Expanding the Frontiers of Engineering Design using Computation. July 27, 2018.

INVITED TALKS

California Institute of Technology, H.B. Keller Colloquium, hosted by Prof. Peter Schröder.
February 28, 2022.

Max Planck Institute, Saarbrücken, Computer Graphics Seminar, hosted by Prof. Vahid Babaei.
June 27, 2019.

Laboratoire Jean Kuntzmann, Grenoble, Calculus of Variations, Geometry, Image Seminar, hosted by Prof. Charles Dapogny. Mar 9, 2018.

Massachusetts Institute of Technology, Graphics/Fabrication Seminar, hosted by Prof. Wojciech Matusik. Oct 6, 2016.

Carnegie Mellon University Robotics Institute, VASC Seminar, hosted by Prof. Stelian Coros. Nov 11, 2016.

TU Vienna, Center for Geometry and Computational Design, hosted by Prof. Helmut Pottman. June 29, 2016.

ETH Zurich, Computer Graphics Seminar, hosted by Prof. Olga Sorkine. June 27, 2016.

EPFL, Computer Graphics Seminar, hosted by Prof. Mark Pauly. June 20, 2016.

IST Austria, Computer Graphics Seminar, hosted by Prof. Bernd Bickel. June 16, 2016.

PATENTS AND TECH BRIEFS

Method of encoding a 3D shape into a 2D surface. US Patent App. 16/186, 901.

Structural weak spot analysis. Q Zhou, D Zorin, J Panetta. US Patent App. 14/438, 181.

NASA Tech Brief NTR 46674: Landmark Detection in Orbital Images using Salience Histograms.

Mentorship

Semester Projects

- M. Vidulis (MS student, EPFL); Topic: Topology opt. with additive manufacturing constraints   2020
- S. Durussel (MS student, EPFL); Topic: Multgrid solver for topology optimization   2020
- A. Sidem (BS student, EPFL); Topic: Elastic rod-based microstructures   2019
- V. Nigolian (MS student, EPFL); Topic: Stress analysis for thin shells   2017
- V. Pollet (MS student, EPFL); Topic: Topology optimization for elastic metamaterial design   2017

Summer Interns

- J. Jouve (BS student, EPFL)   2019
- A. Goncharova (MS student, EPFL); Topic: Simulating networks of elastic rods   2018

PhD Students

- Kai Lan (UC Davis)   2022-
- Zhan Zhang (UC Davis)   2021-
- S. Ren (EPFL)   2019-
- Q. Becker (EPFL)   2019

Professional Service

Program Committee:

Eurographics (2019, 2020, 2021)

SGP - Symposium on Geometry Processing (2019, 2021, 2022)

SMI - Shape Modeling International (2020, 2021)

Reviews:

SIGGRAPH, SIGGRAPH Asia

CAG-D

ACM Transactions on Graphics

Eurographics

SGP - Symposium on Geometry Processing

CGF - Computer Graphics Forum

IEEE Transactions on Visualization and Computer Graphics

Computers & Graphics

Pacific Graphics

SCF - Symposium on Computational Fabrication

Graphics Replicability Stamp, Grant Proposals

Teaching Experience

University of California Davis, Davis, California   Fall 2021
Professor for ECS 230
- Applied Numerical Linear Algebra

University of California Davis, Davis, California   Winter, Spring 2021, Spring 2022
Professor for ECS 289H
- Special topics courses on digital geometry processing and computational fabrication.

École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland   Spring 2018, 2019
Head Teaching Assistant and Stand-in Lecturer for Introduction to Computer Graphics (Prof. Mark Pauly)
- Developed lectures and homework assignments, led recitations, and supervised projects for ~90 students.

École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland   Fall 2017, 2018
Guest Lecturer on Digital Fabrication for Geometry Processing course

NYU Courant Institute, New York, New York   Spring 2017
Teaching Assistant for Geometric Modeling (Prof. Daniele Panozzo)
- Gave recitation lectures, developed homework assignments, supervised projects, and graded

NYU Courant Institute, New York, New York   Spring 2014
Teaching Assistant for Numerical Methods (Prof. Denis Zorin)

Caltech, Pasadena, California   Winter 2009, Fall 2009, Winter 2010
Teaching Assistant
- Graded, held office hours, led recitation sections, and occasionally lectured for Caltech's
  CS2 (Intro to Programming Methods), CS171 (Intro Graphics), and CS176 (Graphics Research)

Research Experience

École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland   Summer 2017-Summer 2020
Postdoctoral Researcher, Advisor: Prof. Mark Pauly
- Developed inverse design algorithms for shape-shifting structures and smart materials

NYU Courant Institute, New York, New York   Fall 2010-Spring 2017
PhD Candidate, Advisor: Prof. Denis Zorin
- Structural analysis, optimal design, periodic homogenization, and additive fabrication
- Large-scale seamless parametrization of triangle meshes

Caltech's Jet Propulsion Laboratory, Pasadena, California   Summer 2008, 2009
Undergraduate Research Fellow, Mentor: Dr. Kiri Wagstaff
- Developed algorithms to detect and classify changes on the surface of Mars

Texas A&M University Supercomputer Facility, College Station, Texas   Summer 2007
Summer Intern, Mentor: Spiros Vellas
- Developed and benchmarked parallel implementations of numerical methods

Non-Research Work Experience

Applied Minds, Glendale, California   Summer 2010
Summer Intern
- Linux networking software and embedded design for a novel communications device prototype

Texas A&M University College of Geoscience, College Station, Texas   Summer 2006
Lead Web Developer
- Redesigned http://geosciences.tamu.edu/ and department websites