

EDUCATION

- University of California, San Diego* San Diego, CA  
• Ph.D., Structural Engineering September 2019
- Università degli Studi di Parma* Parma, IT  
• Master's Degree, Mechanical Engineering March 2014
- McGill University* Montreal, CA  
• Graduate Research Trainee Sept. 2013-Feb. 2014
- Università degli Studi di Parma* Parma, IT  
• Bachelor's Degree, Mechanical Engineering February 2012

SUMMARY

My research aims to develop novel and efficient tools to characterize aerospace composite structures using wave propagation of different physical nature. While focused on aerospace applications, the multi-disciplinary research environment and the combined theoretical and experimental approach allows my research work to be complete, the impact to be broad and the direction to be analytical and under continuous development. My strong independent problem analysis skills are supported by enthusiastic scientific progress and collaborative teamwork.

RESEARCH EXPERIENCE

- Mayo Clinic (Department of Radiology):  
Ultrasound Research Lab* Rochester, MN  
• Ultrasound shear wave elastography for arterial wall properties investigation Oct. 2019 – present
- University of California San Diego: Blue LINC  
(UCSD's first Biomedical Incubator)* San Diego, CA  
• Development of medical devices for detection and visualization of abnormal biological conditions Sept. 2018 - present
- University of California San Diego: FAA, Advanced  
Composite Laboratory and NDE/SHM Laboratory* San Diego, CA  
• Analytical-Numerical models for the simulation of ultrasonic guided wave propagation in structures Apr. 2018 - present  
• Damage Tolerance Guidelines for Stiffened Composite Panels Dec. 2017 - present  
• Non-Destructive Evaluation for Detecting Major Damage in Internal Composite Structures Jan. 2015 - Dec. 2017
- University of California San Diego: NDE/SHM Laboratory*  
• 2D-IR Thermography on Stiffened Composite Panels Nov. 2017 - present  
• Extraction of thermal Green's function using diffuse fields: a passive approach to IR Thermography Jan. 2015 – Jul. 2018  
• Passive high speed rail inspection Sept. 2016 – Sept. 2019

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| <i>McGill University: Vibrations and Fluid-Structure Interaction Laboratory</i>   | Montreal, CA           |
| <ul style="list-style-type: none"> <li>• Active vibration control of a composite sandwich plate: theoretical analysis and experimental results</li> </ul> | Sept. 2013 - Feb. 2014 |
| <i>Università degli Studi di Parma</i>  | Parma, IT              |
| <ul style="list-style-type: none"> <li>• ASHRAE Inverse Modeling energy use applied to a hospital building</li> </ul>                                     | Sept. 2011 – Feb. 2012 |

## EMPLOYMENT EXPERIENCE

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| <i>Assistant Professor</i>   | SDSU, CA   |
| <ul style="list-style-type: none"> <li>• Department of Aerospace Engineering</li> </ul>  | May 2020 – present   |
| <i>Research Fellow</i>   | Mayo Clinic, MN  |
| <ul style="list-style-type: none"> <li>• Department of Radiology - Ultrasound Research Lab</li> </ul>  | Oct. 2019 – July 2020  |
| <i>Teaching Assistant</i>  | UCSD, CA   |
| <ul style="list-style-type: none"> <li>• Solid Mechanics</li> <li>• Nondestructive Evaluation</li> </ul>   | Winter 2017, 2018<br>Spring 2017, 2019                                     |
| <i>Reviewer</i>  |  |
| <ul style="list-style-type: none"> <li>• Applied Sciences</li> <li>• Sensors</li> <li>• IEEE MAS2019</li> <li>• Acoustics</li> <li>• Journal of Aerospace Engineering</li> <li>• Non Destructive Testing and Evaluation</li> </ul> | Feb. 2020<br>Oct. 2019<br>Mar. 2019<br>Feb. 2019<br>June 2018<br>Feb. 2018 |

## SKILLS

- Programming Languages: Matlab
- Engineering Softwares: Abaqus, LS-DYNA, ResearchIR, Mosaiq (TSR), UTWin, SolidWorks
- Other proficiencies: Microsoft Office
- Languages: Italian (mother tongue), English (proficient)

## JOURNAL AND REFEREED CONFERENCE PAPERS

- **Capriotti, M.**, Greenleaf J., Urban M., (submitted). “Time-aligned plane wave compounding methods for high frame rate shear wave elastography: experimental validation and performance assessment on tissue phantoms”, Ultrasound in Medicine & Biology.
- Spada, A., **Capriotti, M.**, Lanza di Scalea, F., (submitted). “Global-Local Model to predict scattering of multiple and dispersive guided elastic waves: 3D application on railroad tracks”, Structural Health Monitoring.

- **Capriotti, M.**, Ellison A., Kim H.E., Kim H., Lanza di Scalea, F., (in preparation). “Data Fusion and Correlation of Ultrasonic guided waves inspection with other conventional NDE techniques for composite aerospace structures”, Composite Structures.
- **Capriotti, M.**, Lanza di Scalea, F., (2020). “Robust non-destructive inspection of composite aerospace structures by extraction of ultrasonic guided-wave transfer function in single-input-dual-output scanning systems”, Journal of Intelligent Material Systems and Structures, 31(5), 651-664.
- Spada, A., **Capriotti, M.**, Lanza di Scalea, F., (2020). “Global-Local Model for guided wave scattering problems with application to defect characterization in built-up composite structures”, International Journal of Solids and Structures, 182, 267-280.
- Liang, A. Y., Sternini, S., **Capriotti, M.**, Lanza di Scalea, F. (2019). High Speed Ultrasonic Rail Inspection by Passive Non-contact Technique. Materials Evaluation, 77(7), 941-950.
- Lanza di Scalea, F., Zhu, X., **Capriotti, M.**, Liang, A., Mariani, S., and Sternini, S., (2018). “Passive Extraction of Dynamic Transfer Function from Arbitrary Ambient Excitations: Application to High speed Rail Inspection from Wheel-generated Waves”, ASME Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems, 1(1), pp. 0110051- 01100512.
- **Capriotti M.**, Kim H. E., Lanza di Scalea F., Kim, H., (2017). “Non-Destructive Inspection of Impact Damage in Composite Aircraft Panels by Ultrasonic Guided Waves and Statistical Processing”, Materials Journal, Special Issue "Structural Health Monitoring for Aerospace Applications 2017", 10(6), 616; doi:10.3390/ma10060616.
- **Capriotti M.**, Cui R., Lanza di Scalea F., (2018). “Damage detection and visco-elastic property characterization of composite aerospace panels using ultrasonic guided waves”, Proceedings of the 2018 Annual Conference of Experimental and Applied Mechanics, Mechanics of Composite, Hybrid and Multifunctional Materials, vol.5.
- **Capriotti M.**, Kim H. E., Lanza di Scalea F., Kim, H., (2017). “Detection of major impact damage to composite aerospace structures by ultrasonic guided waves and statistical signal processing”, X International Conference on Structural Dynamics, EURO DYN 2017.

#### SELECTED CONFERENCE PAPERS

- Spada A., **Capriotti M.**, Cui R., Lanza di Scalea F., (2019). “Improved global-local model to predict guided-wave scattering patterns from discontinuities in complex parts”, Proc.SPIE SMART STRUCTURES AND MATERIALS + NONDESTRUCTIVE EVALUATION AND HEALTH MONITORING 2019, vol. 10972.
- **Capriotti M.**, Cui R., Lanza di Scalea F., (2019). “Guided wave techniques for damage detection and property characterization in composite aerospace structures”, Proc.SPIE SMART STRUCTURES AND MATERIALS + NONDESTRUCTIVE EVALUATION AND HEALTH MONITORING 2019, vol. 10972.
- Lanza di Scalea F., Liang A., Sternini S., **Capriotti M.**, Datta D., Zhu X., (2019). “Passive extraction of Green’s function of solids and application to high-speed rail inspection”, Proc.SPIE SMART STRUCTURES AND MATERIALS + NONDESTRUCTIVE EVALUATION AND HEALTH MONITORING 2019, vol. 10970.
- **Capriotti M.**, Sternini S., Lanza di Scalea F., (2017). “Passive defect detection and imaging in structures by cross-correlations of infrared thermography measurements”, Proceedings of the 11 th International Workshop on Structural Health Monitoring 2017.
- **Capriotti M.**, Kim H. E., Lanza di Scalea F., Kim, H., (2017). “Detection of Impact Damage to Composite Aerospace Structures by Ultrasonic Guided Waves and Statistical Signal Processing”, 2017 Society for Experimental Mechanics Annual Conference on Experimental and Applied Mechanics.
- **Capriotti M.**, Sternini S., Lanza di Scalea F., (2017). “Passive Infrared Thermography for defect detection and

imaging in structures by correlation of diffuse thermal fields”, 2017 Society for Experimental Mechanics Annual Conference on Experimental and Applied Mechanics.

- **Capriotti M.**, Kim H. E., Lanza di Scalea F., Kim, H., (2017). “Development of an Ultrasonic Nondestructive Inspection Method for Impact Damage Detection in Composite Aircraft Structures”, Proc.SPIE SMART STRUCTURES AND MATERIALS + NONDESTRUCTIVE EVALUATION AND HEALTH MONITORING 2017, vol.10169, doi: 10.1117/12.2258669
- **Capriotti M.**, Sternini S., Mariani S., Lanza di Scalea F., (2016). “Extraction of thermal Green’s function using diffuse fields: a passive approach applied to thermography”, Proc.SPIE SMART STRUCTURES AND MATERIALS + NONDESTRUCTIVE EVALUATION AND HEALTH MONITORING 2016, vol. 9803, doi:10.1117/12.2218998
- Ferrari G., **Capriotti M.**, Amabili M., Garziera R., (2014). “Active Vibration Control of a Composite Sandwich Plate”, Proceedings of the 14th International Mechanical Engineering Congress and Exposition ASME IMECE14

#### TECHNICAL MEETINGS AND SEMINARS

- **Capriotti M.**, “Non-Destructive Evaluation Approach Using Guided Waves for Damage Detection of Composite Aerospace Structures”, Structural Engineering Department Seminar, UCSD, May 2019.
- **Capriotti M.**, “Non-Destructive Evaluation Approach Using Guided Waves for Damage Detection and Characterization of Composite Aerospace Structures”, Stanford-MIT-CU Boulder Women in Aerospace Symposium 2018, Stanford, June 2018.
- **Capriotti M.**, Lanza di Scalea F., Kim E. H., Kim H., “Non-Destructive Evaluation for Detecting Major Damage in Internal Composite Structures”, Presentations and Technical Review Meetings at Federal Aviation Administration JAMS 2015-2019; DOT/FAA Final Report, July 2017.
- **Capriotti M.**, Kim Hyungsuk E., Lanza di Scalea F., Kim H., “Non-Destructive Evaluation Methods for Internal Damage Detection in Composite Structures”, UCSD/FAA visit at The BOEING Company, August 2017.

#### AWARDS AND FELLOWSHIPS

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| <i>Carol and Stuart Smith Scholarship</i><br>Friends of the International Center and University of California | March 2019   |
| <i>Spring Quarter Dissertation Fellowship</i><br>Structural Engineering Department, UCSD                      | March 2019   |
| <i>Research Startup SDSC Resources</i><br>Extreme Science and Engineering Discovery Environment (XSEDE, NSF)  | January 2019 |