

# Gerardo Andrés Mazzei Capote

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## SUMMARY

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Mechanical engineer with a minor in business. Experienced in polymer-based additive manufacturing technologies and polymer processing. Highly skilled in thermal analysis and mechanical testing of polymers, as well as composite theory and failure criteria. Versatile communicator.

## EDUCATION

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- **University of Wisconsin-Madison** - *Madison, WI, U.S.A.*
  - **PhD:** Mechanical Engineering — 2018 - *present* (Expected August 2021)
  - **MSc:** Mechanical Engineering — 2016 - 2018.
- **Universidad Simón Bolívar** - *Caracas, Venezuela*
  - **BSc:** Materials Engineering — 2009 - 2016.

## ENGINEERING EXPERIENCE

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**PhD Candidate** under Prof. Tim Osswald, UW-Madison **August 2016 - Present**

- Manufactured a cost-effective heat exchanger using filled conductive thermoplastic materials.
- Designed and manufactured a low-cost, thermoformed reusable N9X mask during the COVID19 pandemic.
- Developed a failure surface for FFF parts using careful design of experiments based on statistics and mechanics of materials.
- Developed and produced 3D printed coupons with unusual bead orientations using a customized 6-axis robotic printer.
- Extruded an ABS FFF filament with tight dimensional tolerances to achieve high precision volumetric output during 3D printing.
- Aided in the design of topological crystal insulators to be manufactured through Additive Manufacturing techniques.

## SKILLS

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**Polymer processing techniques:** Extrusion, Injection Molding, FDM/FFF, SLS, DLS

**Analysis techniques:** TGA, DSC, LFA, DMA, Destructive Mechanical Testing,  $\mu$ CT

**Programming languages:** MATLAB, Python, R, RAPID, G-code

**Engineering software:** Solidworks, EES, Origin, Jupyter Notebooks

**Other software:** Microsoft Office Suite, Adobe Animate

**Languages:** English, Spanish, Portuguese

## OTHER EXPERIENCE

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**Teaching Assistant** University of Wisconsin-Madison **August 2017 - Present**

Responsible for the instruction and grading of 'ME370 - Energy Systems Lab', 'ME514 - Additive Manufacturing', and 'ME418 - Engineering Design with Polymers', all offered by the Mechanical Engineering Department. Consistently received high ratings from students.

**Vice President** Society of Plastic Engineers - Madison Chapter **August 2018- May 2020**

Coordinated industry visits and outreach activities aimed at increasing the interest of engineering students in the field of polymer processing.

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## TECHNICAL PRESENTATIONS

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AMUG	Chicago, IL	2019
• <i>A Novel Failure Criterion Applied for Fused Filament Fabrication Parts.</i>		
RAPID	Fort Worth, TX	2018
• <i>A Tensor Based Failure Criterion for FFF Manufactured Parts.</i>		
SFF	Austin, TX	2017
• <i>Towards a Robust Production of FFF End-User Parts with Improved Tensile Properties.</i>		

## PUBLICATIONS

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1. T Pfeifer et al. "Optimization of the FDM™ additive manufacturing process". In: *74th Annual Technical Conference and Exhibition of the Society of Plastics Engineers, Indianapolis 2016* (2016), pp. 22–26. URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85010644519&partnerID=40&md5=1f4521e160fe433ad37ef9bb587ee72e>
2. Gerardo A. Mazzei Capote et al. "Towards a Robust Production of FFF End-User Parts with Improved Tensile Properties". In: *Proceedings of the 28th Annual International Solid Freeform Fabrication Symposium – An Additive Manufacturing Conference*. Austin, TX, 2017, pp. 507–518
3. Gerardo A. Mazzei Capote et al. "Failure surface development for ABS fused filament fabrication parts". In: *Additive Manufacturing* 28, April (2019), pp. 169–175. ISSN: 22148604. DOI: [10.1016/j.addma.2019.05.005](https://doi.org/10.1016/j.addma.2019.05.005). URL: <https://doi.org/10.1016/j.addma.2019.05.005>
4. J.L. Colón Quintana et al. "Viscoelastic properties of fused filament fabrication parts". In: *Additive Manufacturing* 28 (2019). ISSN: 22148604. DOI: [10.1016/j.addma.2019.06.003](https://doi.org/10.1016/j.addma.2019.06.003)
5. Gerardo A. Mazzei Capote, Alec Redmann, and Tim A. Osswald. "Validating a Failure Surface Developed for ABS Fused Filament Fabrication Parts through Complex Loading Experiments". In: *Journal of Composites Science* 3.2 (2019). DOI: <https://doi.org/10.3390/jcs3020049>
6. P. V. Osswald et al. "Failure Criterion for PA 12 Multi-Jet Fusion Additive Manufactured Parts". In: *Additive Manufacturing* July (2020), p. 101668. ISSN: 2214-8604. DOI: [10.1016/j.addma.2020.101668](https://doi.org/10.1016/j.addma.2020.101668). URL: <https://doi.org/10.1016/j.addma.2020.101668>

## ADDITIONAL INFORMATION

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- Exchange student through the Rotary Youth Exchange Program (August 2008 to June 2009).
- Venezuelan and Italian citizenship.
- Holder of Brazilian permanent resident visa.