Gerardo Andrés Mazzei Capote

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SUMMARY

Detail-oriented mechanical engineer with experience in polymer-based additive manufacturing technologies and polymer processing. Highly skilled at communicating. Can perform a variety of mechanical and thermal characterization tests, and develop a failure envelope for highly anisotropic parts using advanced failure criteria.

EDUCATION

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

ENGINEERING EXPERIENCE

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

- Extruded a customized ABS filament with tight dimensional tolerances to achieve high precision volumetric output during 3D printing.
- Predicted part failure of 3D printed parts using a failure criterion that includes stress interactions.
- Developed and produced 3D printed coupons with unusual bead orientations using a customized 6-axis robotic printer.
- Collaborated with a company to develop a 3D printer with in-line sensors that capture processing parameter data in real time.
- Supervised the extrusion of Polyethylene Terephthalate (PET) filament produced with discarded bottles as the parent material.
- Developed and manufactured a low-cost, reusable N9X concept mask during the COVID19 pandemic.

SKILLS

Polymer processing techniques: Extrusion, Injection Molding, FDM/FFF, SLS, DLS
Analysis techniques: TGA, DSC, LFA, DMA, Destructive Mechanical Testing, μCT
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

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.

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

AMUG Chicago, IL **2019**

- *A Novel Failure Criterion Applied for Fused Filament Fabrication Parts*.

RAPID Fort Worth, TX **2018**

- *A Tensor Based Failure Criterion for FFF Manufactured Parts*.

SFF Austin, TX **2017**

- *Towards a Robust Production of FFF End-User Parts with Improved Tensile Properties*.

PUBLICATIONS

1. 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
2. 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. URL: https://doi.org/10.1016/j.addma.2019.05.005
3. 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

ADDITIONAL INFORMATION

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