Adam P. Generale

CONTACT INFORMATION
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EDUCATION

Georgia Institute of Technology, Atlanta, GA, USA (exp.) 2024
Ph.D. Mechanical Engineering
- Thesis: "Stochastic Scale-Bridging and Applications in Inverse Microstructure Design"
- Advisor: Surya R. Kalidindi

University of Manchester, Manchester, UK 2014
M.S. Mechanical Engineering
- Thesis: "Generalized Deformation in Heterogeneous Materials in Mode I Fracture"
- Advisor: Andrey Jivkov

Rensselaer Polytechnic Institute, Troy, NY, USA 2011
B.S. Mechanical Engineering

EXPERIENCE

Multiscale Technologies, Atlanta, GA, USA Jan 2023 - Present
Materials Data Scientist
- Facilitated the incorporation of machine learning techniques into the software platform for the creation of relating materials' microstructure to their effective properties.
- Directly communicated with CTO and CEO regarding model architectures most appropriate for uncertainty quantification in multi-objective data-sparse applications.

Air Force Research Laboratory, Dayton, OH, USA Jun 2020 - Oct 2020
Research Intern
- Developed framework for the statistical fusion of sparse disparate experimental data in the simultaneous Bayesian calibration of a visco-elastoplastic multimode constitutive damage model.

Pratt & Whitney, East Hartford, CT, USA Feb 2016 - April 2020
Senior Aero/Thermal Engineer
- Designed internal cooling schemes and performed thermal analyses of HPT and LPT airfoils for advanced military test demonstrator engines to ensure the parts could meet mission life requirements or test goals.
- Determined internal and external convective boundary conditions for the thermal analysis of turbine airfoils through the use of proprietary flow network solvers, empirical relationships and CFD cases.
- Worked on a team to develop architecture for insertion of CMC turbine airfoils into the LPT of advanced military engines.
- Performed life estimation calculations of CMCs through investigations of volatilization rates and strength reductions associated with exposure to combustion environments.
- Wrote optimization scripts in order to establish internal cavity geometry through evaluation of thermal gradients, surface and coating interface temperatures.
- Evaluated the feasibility of utilizing non-conforming castings through sequentially coupled thermo-mechanical models for the F135 Navy Fuel Burn Reduction test demonstrator, an advanced build of the F135.
- Fitted Accelerated Mission Testing data to statistical models in order to predict distress growth rates and set field inspection criteria for the hot section on the F135 engine.

Chromalloy, Middletown, NY, USA Sep 2011 - Aug 2013 & Nov 2014 - Jan 2016
Process Engineer
- Established sequentially coupled thermo-mechanical models to successfully manage thermal stresses in the laser metal deposition of IN738 and CM247 LC without preheating the substrate, and to determine penetration depth of welds.

- Directed development projects including laser drilling, laser material deposition, selective material removal, and laser fusion welding in the production, assembly, and repair of advanced industrial gas turbine components.
- Directly communicated with domestic and international customers, such as Siemens AG, Sulzer, and Alstom regarding manufacturing specifications, drawings, process results, and submission of qualification brochures.

AWARDS

Sloan Foundation Fellowship, Alfred P. Sloan Foundation	2020
President's Fellowship, Georgia Institute of Technology	2020
Team of the Quarter, Pratt & Whitney	Q2 2016, Q4 2017
Best Dissertation, University of Manchester	2014
Best Overall Performance, University of Manchester	2014
Rensselaer Leadership Award, Rensselaer Polytechnic Institute	2007

TECHNICAL KNOWLEDGE

Statistical Modeling, Data Analysis, Numerical Methods, Finite Element Analysis, Continuum Mechanics, High-Performance Computing

Software: Microsoft Office, ABAQUS, ANSYS, Fluent, MATLAB, C/C++, Python, LaTeX

PUBLICATIONS

Generale, A.P., Hall, R.B., Brockman, R.A., Joseph, V.R., Jefferson, G., Zawada, L., Pierce, J., Kalidindi, S.R. (2022). Bayesian calibration of continuum damage model parameters for an oxide-oxide ceramic matrix composite using inhomogeneous experimental data. *Mechanics of Materials*, 175, 104487. doi: 10.1016/j.mechmat.2022.104487.

Hall, R.B., Brockman, R.A., **Generale, A.P.**, Joseph, V.R., Kalidindi, S.R. (2022). A Viscous Damage Throey for Ceramic Matrix Composites in Multi-Axial Loading. *Proceedings of the 12th International Conference on the Mechanics of Time Dependent Materials*.

Generale, A.P., Kalidindi, S.R. (2021). Reduced-order Models for Microstructure-Sensitive Effective thermal Conductivity of Woven Ceramic Matrix Composites with Residual Porosity. *Compos. Structures*, 274, 114399. doi: 10.1016/j.compstruct.2021.114399

PATENTS

Quach, S., **Generale, A.P.**, Surace, R., Dvorozniak, L., 2022. Engine with cooling passage circuit for air prior to ceramic component. US11492914B2.

Generale, A.P., Dvorozniak, L., Quach, S., 2022. Ceramic airfoil with cooling air turn. US11473444B2.

Generale, A.P., Dvorozniak, L., Quach, S., 2022. Baffle with impingement holes. US11415002B2.

Generale, A.P., Mongillo, D.J., 2022. Components for gas turbine engines. US11371360B2.

Quach, S., Dube, B.P., Propheter-Hinckley, T.A., Arisi, A.N., **Generale, A.P.**, Dvorozniak, L., Liles, H.J., 2022. Cooling arrangement including overlapping diffusers. US11339667B2.

Generale, A.P., Dvorozniak, L., Quach, S., Dube, B.P., 2022. Baffle with tail. US11280201B2.

Generale, A.P., Mongillo, D.J., 2022. Components for gas turbine engines. US11261749B2.

Generale, A.P., Mongillo, D.J., 2022. Trailing edge insert for airfoil vane. US11242758B2.

Generale, A.P., Propheter-Hinckley, T.A., 2021. Airfoil assembly with ceramic airfoil pieces and seal. US11162368B2.

Spangler, B.W., **Generale, A.P.**, Vu, K.H., 2021. Gas turbine engine cooling component. US11131212B2.

Generale, A.P., Liles, H.J., 2021. Airfoil with metallic shield. US11092015B2.

Generale, A.P., Dube, B.P., 2021. Thermal gradient reducing device for gas turbine engine component. US11078844B2.

Generale, A.P., Dube, B.P., 2021. CMC airfoil with cooling holes. EP3808940A1.

Spangler, B.W., **Generale, A.P.**, 2021. Shell and spar airfoil. US10934857B2.

Jackson, R.W., **Generale, A.P.**, Liu, X., Zelesky, M.F., 2021. Airfoil having environmental barrier top-coats that vary in composition by location. EP3782968A1.

Vu, K.H., **Generale, A.P.**, 2020. Vane platform leading edge recessed pocket with cover. US10822962B2.

Devore, M.A., **Generale, A.P.**, Propheter-Hinckley, T.A., 2020. Airfoil with geometrically segmented coating section. US10711624B2.

Spangler, B.W., **Generale, A.P.**, 2020. Axial flow cooling scheme with castable structural rib for a gas turbine engine. US10822963B2.

Mongillo, D.J., **Generale, A.P.**, 2020. Platform flow turning elements for gas turbine engine components. US10655496B2.

Spangler, B.W., **Generale, A.P.**, 2020. Gas turbine engine cooling component. US10648351B2.

Generale, A.P., Howard, B.L., 2020. Vane air inlet with fillet. US10619492B2.

Clum, C., **Generale, A.P.**, 2019. Adjustable flow split platform cooling for gas turbine engine. US1051 3947B2.

Thornton, L.M., **Generale, A.P.**, 2019. Vane including internal radiant heat shield. EP3567220B1.