

Joseph T. Bonivel Jr., Ph.D.
Senior Fellow and Science & Technology Policy Expert
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PROFESSIONAL PROFILE

Skilled R&D engineer with a wealth of knowledge and experience in developing and implementing innovation policies and strategic partnerships. Technical project manager for the Department of Defense Office of the Undersecretary of Defense for Research and Engineering's Journal of DoD Research & Engineering. Senior Fellow for Atlantic Council's Geotech Center and former AAAS Big Data and Analytics Science and Technology Policy Fellow for National Science Foundation Small Business Innovation Research (SBIR) portfolios developing innovative engineering technology start-up companies and programs from the founding phase to exit or full implementation strategies

KEY SKILLS

Science and Technology Policy Analyst | Technical Marketing | Product Development | Nano-Macro Mechanical Testing
Material Characterization | Metallurgy | Nano Material Synthesis | Tribosurface Optimization | Electron Microscopy
Data Analytics | Software Programming | Film Deposition | Statistics | Design of Experiments | Quality Control
Advanced Manufacturing | Program Management | Grant Writing | Failure Analysis | MatLab | Python | SQL Query |

POLICY EXPERIENCE

Project Director, Subject Matter Expert, DoD Research & Engineering, Washington D.C.

SABRE SYSTEMS/ SURVICE ENGINEERING – Defense Technical Information Center, USDR&E, 2017–Present

- Project lead in the development of the Journal of DoD Research and Engineering
- Established scientific outreach and communications program for Journal of DoD Research & Engineering ensuring efforts reach all 73 DoD laboratories and over 70k scientist and engineers
- Evaluated the effectiveness of outreach programs through data analytics collected from surveys and usage metrics
- Cultivated relationships with senior-level DoD armed forces liaisons ensuring collaboration through scientific innovations to advance the warfighter
- Completed a comprehensive technical analysis and review of >50 scientific articles for DoD innovations
- Published technical articles in collaboration with DoD laboratory scientists and engineers

Nonresident Senior Fellow, Washington D.C.

Atlantic Council – Geotech Center

2019 – Present

- Encourages global tech collaborations, evaluates good tech choices as well as measurable policy alternatives and educates world leaders and the public on issues related to global tech competition
- Identifies choices affecting the use of new technologies and data that explicitly benefit people, prosperity, and peace
- Recommends positive paths forward to help markets and societies adapt to considering technology- and data-induced changes
- Determines priorities for future investment among public and private entities seeking new technologies and data initiatives specifically for global benefit
- Subject matter expert delivering forums and published papers on entrepreneurship, internet of things, technology & innovation, defense technologies, and space exploration

AAAS Big Data and Analytics Science Technology & Policy Fellow, Washington D.C.

National Science Foundation – Small Business Innovation Research (SBIR) & Innovation Corps (I-Corps™) 2016 - 2017

- Advanced the national Innovation Corps™ (I-Corps™) program goals by ensuring alignment between NSF policy goals and Congressional milestones from the America COMPETES Act
- Collaborate with Office of Science and Technology Policy (OSTP) at the White House initiation of other federal agencies (NASA, DHS, DOE, NIH, DoD) into the Innovation Corps™ program to emphasize innovation ecosystem across all funding agencies
- Manage and scale the NSF National Innovation Network, a consortium of universities and national labs created to spur the innovation start up ecosystem born from federally funded research
- Collaborated with national and local subject matter experts in technical research, venture capital, marketing, and entrepreneurship education to ensure all facets of the ecosystem are engaged

- Manage and advise the regional node and local site leaders on program implementation for the National Innovation Network
- Develop and implement innovation ecosystem competencies for National Innovation Network sites and nodes to include grant programs and challenges administered by the network
- Evaluation of proposals, selection of awardees, and approval of awards to the awardees for the Innovation Corps™ Sites and Nodes program
- Manage program operations and implementation strategies for the National Innovation Network
- Monitor and evaluate the effectiveness and efficiency of the Innovation Corps™ sites and nodes programs by developing data visualizations and technical reports, project management reports to track the program goals and implementation of programs from the National Science Foundation
- Created and implemented Innovation Corps™ program strategies to increase and enhance the mission and effectiveness of National Science Foundation
- Provide technical and program supervision for the Innovation Corps™ network through distributed communication channels within the National Innovation Network
- Pinpointed a funding pipeline to increase number of successful awards for I-Corp™ graduates applying to SBIR and other federal grants for prototyping of startup ventures (more than \$65M)
- Developing strategic public-private partnerships with venture capitalist and angel investors to advance federally funded research to commercialization through private and federal capital investments (more than \$100M)

AAAS Big Data and Analytics Science Technology & Policy Fellow, Washington D.C.

United States Agency for International Development (USAID), – Global Development Lab

2015 – 2016

- Developed, connected, improved, and scaled key open-source data software platforms and health information system policies for inter-operability within Liberia, Sierra Leone, and New Guinea to drive disease epidemic responses (ergo Ebola epidemic)
- Defined challenges and developed strategies to employ innovation within the health information systems in the Ebola affected countries in support of United State Agency for International Development's mission
- Developed technical component sourcing strategy and milestones for interoperability of the health information systems
- Provided oversight to USAID contractors working in the Ebola affected countries on health information system interoperability
- Facilitated partnerships with foreign government Ministries of Health, foreign implementing partners, and US based donor agencies to identify barriers to health information system interoperability in West Africa and developed strategic implementations to overcome those barriers
- Evaluated Ebola Grand Challenge proposals and executed agency funds (excess of \$1M) for health information systems through a co-creation convening for the Ebola response in Liberia, Sierra Leone, and New Guinea
- Conducted analyses of health information system agency budget components to support developed spending plans, while tracking committed funds and costing data
- Development of predicative data mining techniques to determine United States government's impact on its foreign implementing partners and strategic leadership on leveraging these partnerships
- Established policy protocols for how adaptive management can be utilized within USAID agency programs, through the creation of management feedback loops and leveraging real time data for decision making across the agency

PROFESSIONAL ENGINEERING EXPERIENCE

Digital Business Initiatives and Data Analytics Specialist

United Technologies Corporation Research Center, East Hartford, CT

2013 – 2016

- Designed portfolio assessments on UTC business units to identify areas of business development for United Technologies Corporation resulting in increasing federal funds by \$3 million
- Evaluated research and development programs within various business units of United Technologies Corporation with budgets ranging from \$50,000 to 2 million dollars
- Directed principal investigation and project management for business unit research proposals awarded above \$1 million, including but not limited to national funding agencies, business case proposals, and university-led research
- Oversaw technical readiness level (TRL) technology assessments, technical performance audits, and engineering-related audits on research and development programs of UTC businesses

- Established, revised, and reviewed technical policies, engineering procedures, and engineering objectives as necessary to eliminate workflow problems or barriers to company objectives

Senior Research Engineer

United Technologies Corporation Research Center, East Hartford, CT

2011 – 2013

- Responsible for developing and identifying test protocols and standards to evaluate the mechanical performance of advanced materials, components, and structures to all the business units of United Technologies Corporation (UTC)
- Responsible for developing and identifying test protocols and standards to evaluate the mechanical performance of advanced materials, components, and structures within the various business units of United Technologies Corporation including but not limited to the aerospace industry, U.S. Department of Defense, and commercial business units such as Carrier and Otis Elevator
- Portfolio assessments on UTC business units to identify areas of business development for United Technologies Corporation resulting in increasing federal funds by \$3 million
- Evaluations research and development programs within various business units of United Technologies Corporation with budgets ranging from \$50,000 to \$2 million dollars
- Methodological strategic support on evaluation activities on government contracts including outcome monitoring and the relationship building with business intelligence and government portfolios
- Examination of tribological properties for failure analysis of materials, coatings, and components through friction and wear testing equipment for improved erosion, wear, or friction variables
- Subject matter expert on external micro and macro microscopy and mechanical testing techniques to probe into the internal structure and properties of advanced materials developed by the research center
- Failure analysis and the investigation of root cause for advanced materials, components, and structures for proprietary components of United Technology Corporation commercial business units
- Principal investigation and project management for business unit research proposals awarded above \$1 million, including but not limited to national funding agencies, business case proposals, and university led research
- Lead technical readiness level (TRL) technology assessments, technical performance audits, and engineering related audits on research and development programs of UTC businesses
- Data science assessments to determine strength and reliability on UTC Aerospace and Defense components using structural health monitoring and fatigue/failure techniques
- Developed and advised on requirements for design of experiments and statements of work for contracting purposes external to UTC core business units, including government agencies and universities
- Applied statistics, probabilistic modeling, optimization, decision analysis, data integration, and visualization tools to perform complex analyses on UTC engineering innovation programs
- Established, revised, and reviewed technical policies, engineering procedures and engineering objectives as necessary to eliminate workflow problems or barriers to company objectives

PEDAGOGICAL EXPERIENCE

Barry University, Miami, FL

Adjunct Professor: Mathematical Sciences

2011–2012

- Designed and delivered three 12-week statistics courses focused on statistical data analysis, reasoning, and inference to 35 continuing education students as part of the business administration curriculum
- Fostered student understanding of statistical software packages to analyze logical batched and non-batched statistical challenges
- Mentored 14 adult education students transitioning to STEM careers

National Science Foundation (NSF), Tampa, FL

2008–2010

Teaching Fellow

- Implemented student lessons in introductory fundamentals of engineering courses, which infused Science and Engineering principles as well as cutting-edge technology, such as nanotechnology, optics, computer vision, etc., into the country's 8th largest school district's (Hillsborough County) title I elementary school curriculum
- Fostered systemic policy change in 90 elementary title I schools that increased student interest in science and technology by 25%

EDUCATION

Ph.D., Engineering Science: Focus Materials Science & Mechanical Engineering

University of South Florida

GPA 3.6

Dual Focus: Mechanical and Material Science Engineering

Dissertation: *Consumable Process Optimization for Chemical Mechanical Planarization of Patterned Media Storage Fabrication*

M.S., Mechanical Engineering

Carnegie Mellon University

GPA 3.6

Dual Focus: Mechanical and Material Science Engineering

Thesis: *The Effects of Microstructure on Chemical Mechanical Planarization of Thin Films*

M.S., Biomedical Engineering

University of South Carolina

GPA 3.7

Thesis: *Dynamic Simulation of Human Gait for Design of Trans-Tibial Prosthetic Amputees*

B.S., Mechanical Engineering

University of South Carolina

GPA 3.2

Thesis: *Enhancing Performance of Combustion Engines Camless Engine Integration*

SELECTED PUBLICATIONS

- Inman, Maria E., **Bonivel, J.**, et al. "Green Process for Functional Trivalent Chromium Electroplating." The Electrochemical Society, (2013)
- **Bonivel, J** et al. "Chemical Mechanical Planarization Pad Characterization using Novel Non-Destructive Techniques for Patterned media Magnetic Storage Fabrication," The Electrochemical Society, (2011)
- **Bonivel, J.T.** Consumable Process Development for Chemical Mechanical Planarization of Bit Patterned Media for Magnetic Storage Fabrication, dissertation Fall (2010)
- **Bonivel, J.** et al. "Characterization on Chemical Mechanical Polishing of Patterned Media Data Storage," Journal of Vacuum Society B, (2010)
- **Bonivel, Joseph**, et al. "The Effects of Hardness Variation on a CMP Model of Copper thin Films." MRS Proceedings. Vol. 1157. Cambridge University Press, (2009)
- **Bonivel, J.**, et al., "The Effect of Microstructure on Chemical Mechanical Polishing Process of Thin-Film Metals," ASME International Journal of Tribology Conference Proceedings (44488): p. 1-2, (2007)
- Higgs, C. F., Terrell, E., **Bonivel, J.**, Biltz, S., Kuo, M., and Ozdoganlar, B., "On a Particle-Augmented Mixed Lubrication Approach to Predicting CMP," MRS Symposium Proceedings Spring (2007)
- Voglewede, P., **Bonivel, J.**, "Dynamic Simulation of Human Gait for New Transtibial Prosthetic," ASME Proceedings of DETC (2006)

SELECTED ENGINEERING PRESENTATIONS

- Joseph Bonivel, "Indentation-Based In-Situ Toughness Characterization Utilizing Nanomechanical Characterization Techniques," TMS Annual Meeting & Exhibition; Orlando, FL (2015)
- Joseph Bonivel, "Study of Reliability and Modeling for Process Optimization and Yield Improvements in Chemical Mechanical Planarization (CMP)," National Science Foundation Civil Mechanical Manufacturing Innovation Annual Conference; Washington, DC (2011)
- Joseph Bonivel, "Non-Destructive Characterization for Sustainable Design of Chemical Mechanical Planarization Pads," "National Science Foundation Civil Mechanical Manufacturing Innovation Annual Conference; Washington, DC (2011)
- NSF CMMI conference poster presentation, "Study of Reliability and Modeling for Process Optimization and Yield Improvements in Chemical Mechanical Planarization (CMP)," Atlanta, GA (2011)

PROFESSIONAL MEMBERSHIPS

American Association for Advancement Science | American Society of Mechanical Engineers | National Society of Black Engineers | Society of Tribology and Lubrication Engineers | Society of Manufacturing Engineers | Institute of Electrical and Electronics Engineers | The Minerals, Metals, and Materials Society

CERTIFICATIONS

Achieving Competitive Excellence (ACE) Associate | UTC Six Sigma | UTC Business Development | PMP Certification in progress

A W A R D S

SNEATP Technologist of the Year (2015) | Black Enterprise (BE) Magazine Modern 100 Men

UTC Senior Vice President Award of Excellence | Barry University Faculty Member of the Year | NSF Fellow NSF CMMI Award

NSF-MRI Fellow | Alfred P. Sloan Minority Ph.D. Scholar | Bridge to Doctorate Fellow | MRSEC Fellow

Exxon Mobile Fellow | RCS Fellow | Life Scholar Fellow