

PROMOTION RECOMMENDATION
The University of Michigan – Flint
College of Arts and Sciences
Department of Computer Science, Engineering, and Physics

Mihai Burzo, assistant professor of engineering, Department of Computer Science, Engineering, and Physics, College of Arts and Sciences, is recommended for promotion to associate professor of engineering, with tenure, Department of Computer Science, Engineering, and Physics, College of Arts and Sciences.

Academic Degrees:

Ph.D.	2001	Southern Methodist University
M.S.	1995	Technical University, Cluj-Napoca
B.S.	1995	Technical University, Cluj-Napoca

Professional Record:

2013-Present	Assistant Professor of Mechanical Engineering, University of Michigan-Flint, Michigan
2011-2013	Assistant Professor of Mechanical and Energy Engineering, University of North Texas at Texas
2008-2011	Vice President of Product Development, TMX Scientific Inc., Texas
2006-2011	Research Scientist, Nanoscale Electro-Thermal Sciences Laboratory, Texas
2002-2005	Postdoctoral Fellow, Southern Methodist University, Texas
1996-2001	Research Assistant, Southern Methodist University, Texas
1995-1996	Design/Project Engineer, Institute of Research and Design in Food Industry and Refrigeration, Romania

Summary of Evaluation:

Teaching: Professor Burzo defines his approach to teaching as one aimed to develop his students' "engineering intuition." In addition to ensuring that his students acquire the scientific knowledge and technical skills needed to be successful, Professor Burzo's pedagogy also instills holistic and critical thinking so that his students can develop their own effective and creative solutions to engineering problems. In practice, Professor Burzo integrates four essential student learning principles within his courses: a student-centered, active learning pedagogy that is sensitive to student need; cross-disciplinary teaching that emphasizes the integration of content knowledge across classes; use of illustrative and practical examples of complex theories and concepts; and lastly, the application of educational technology help him communicate, and students visualize, these theoretical and abstract concepts. Professor Burzo has applied this approach to ten different courses as well as a variety of topics through multiple independent studies. Professor Burzo's teaching portfolio includes introductory courses such as "Introduction to Engineering" and "The Engineering Profession," an intermediate course in "Statics," and a variety of upper division courses including "Thermodynamics," "Heat Transfer," and "Dynamics."

The results of his course evaluations demonstrate consistently high ratings – averages for his thirty-three courses being between 4.49 and 4.79 on a five point scale. Professor Burzo's dedication to student learning is also illustrated by the following student comment: "He is consistently able to describe very complex ideas in ways that are intuitive for students. He creates a productive learning atmosphere, without the need for intimidation. He has always given his students his very best, and for that we are extremely grateful." Professor Burzo's commitment to student learning is further evidenced by his clear syllabi with specific course objectives and learning outcomes, and the assignment of engaging learning activities such as constructing a model bridge with Fettuccine and a hot glue gun. Professor Burzo also enhances student learning through his work in the area of student learning assessment by collecting assessment data in his courses, participating in an ABET symposium on assessment, and his work to secure ABET accreditation. His dedication to student learning is also demonstrated by his role as an academic advisor. Since his arrival

at the University of Michigan-Flint, Professor Burzo has advised over one hundred students and through these interactions, he not only developed an Advising Policy and Procedure document, but more importantly, came to better understand his students' needs and concerns. Finally, Professor Burzo contributes to student learning through his mentorship and his willingness to involve over fifty of his students – undergraduate through a postdoctoral fellow – in numerous research projects and another thirty-three students in independent studies. These collaborations have allowed several of his students to co-author published papers with Professor Burzo and have undoubtedly enriched their educational experience at the University of Michigan-Flint.

Research: Professor Burzo has a background in thermal and fluid flow sciences with an emphasis on heat transfer in micro and nano-structures. Professor Burzo also has completed scholarship in the areas of computational fluid dynamics, refrigeration, energy efficiency and renewable energy. Since his arrival at the University of Michigan-Flint in the fall of 2013, Professor Burzo has been extremely successful in parlaying his expertise to two significant areas of application. The first utilizes his intellectual background to create an innovative approach to deception detection that integrates thermal imaging with linguistic, facial and physiological data. The second application again employs a multi-modal data collection method to predict human comfort in a vehicle or a building. Professor Burzo's scholarly activity since 2013 has been published in two book chapters, one peer reviewed journal article, and twenty peer reviewed conference proceedings. In addition, Professor Burzo had two journal articles accepted for publication this summer and has three papers under review. Of these peer-reviewed conference papers, two have been recognized with best paper awards – the “Measurement of Thermal Conductivity of Nanofluids and TIMs Using the Laser-Based Transient Thermoreflectance Method” in 2014 and the “Human Acute Stress Detection via Integration of Physiological Signals and Thermal Imaging” of 2016 – the latter includes co-authorship with his post-doctoral fellow. Over his career, Professor Burzo has twenty-three journal and journal quality publications, two book chapters, and forty-six peer-reviewed conference papers. Professor Burzo also has a very impressive record of grant funding that underscores the relevance and innovative promise of his projects. Since the fall of 2013, Professor Burzo has secured over \$1.5 million in grant support from such prestigious funding agencies as the National Science Foundation (\$300k), the Toyota Research Institute (\$850K), and an upcoming Proctor and Gamble grant (\$300K). As testament to the value of Professor Burzo's research and its potential for application, Professor Burzo has attended five trade shows and has a patent pending with his colleagues entitled, “Multimodal Sensing of Thermal Comfort for Adaptive Climate Control in Vehicles and Buildings.” Finally, it is important to note that Professor Burzo firmly supports his students in his various research projects – whether through his numerous external grants, or through institutional mechanisms such as the Undergraduate Research Opportunity Program or the Research and Creative Activity grants. In total, some fifty students and one postdoctoral fellow have participated in his research activities with several students and the postdoctoral fellow co-authoring peer reviewed papers.

Recent and Significant Publications:

Mihai Burzo, Mohamed Abouelenien, Veronica Perez-Rosas, Rada Mihalcea, “Multimodal Deception Detection”, *Handbook of Multimodal-Multisensor Interface*, Morgan Claypool, 2017.

Veronica Perez-Rosas, Cristian Bologa, Mihai Burzo, Rada Mihalcea, “Deception Detection Within and Across Cultures”, *Text mining*, Springer, 2015.

Mihai Burzo, Daniel McDuff, Rada Mihalcea, Louis-Philippe Morency, Alexis Narvaez, Veronica Perez-Rosas, “Sensing Affective Response to Visual Narratives”, *IEEE Computational Intelligence*, 2018.

Mohamed Abouelenien, Veronica Perez-Rosas, Rada Mihalcea, Mihai Burzo, “Detecting Deceptive Behavior via Integration of Discriminative Features from Multiple Modalities”, *IEEE Transactions on Information Forensics and Security*, vol. 12, no.5, pp. 1042-1054, 2017.

Service: Professor Burzo has assembled a strong record of service to his department, college, university, local community and profession. Immediately upon his arrival at the University of Michigan-Flint in the

fall of 2013, Professor Burzo began serving his department and students by establishing a local student chapter of the Society for Automotive Engineers and a co-advisor of UM-Flint's student section of the American Society of Mechanical Engineers. In his department, Professor Burzo has served on numerous committees, including the CSEP Engagement Committee, ad hoc UM-Flint Engineering committee on Industry Advisory Board, the department's Strategic Planning Steering Committee, and two scholarship committees. In addition to his departmental service on a variety of ad hoc committees such as the By-Laws, Professional Development, and Handbook committees, Professor Burzo has also participated in four faculty searches. At the college and university levels, Professor Burzo has also made significant service contributions. For the college, Professor Burzo is currently serving on a LEO Major Review Committee and has completed service on the Strategic Planning Committee, the Nominating Committee, and a Spring Interim Committee. For the university, Professor Burzo participates in both University of Michigan-Flint and Tri-Campus forms of leadership and faculty governance. Locally, Professor Burzo is currently serving on the university's Nominating Committee, and has served on numerous planning and search committees. For the University of Michigan system, Professor Burzo is currently a representative of the University of Michigan-Flint to the Senate Assembly and is a member of the University of Michigan Tri-Campus Task Force.

Professor Burzo is an active member of his professional community as a member of six organizations – the American Society of Mechanical Engineers, the Institute of Electrical and Electronics Engineers, the Society of Automotive Engineers, the American Physics Society, the Association of Computing Machinery, and the American Society for Engineering Education. His membership also involves organizing sessions, serving as a chair or co-chair of program committees and working on the Scientific Committee of the Solutions for Energy and Environment Conference in 2018. Professor Burzo has served as a grant reviewer for the National Science Foundation, as well as volunteering his time and expertise as a peer reviewer for one to three papers for some fifteen journals or conferences annually. Finally, Professor Burzo gives generously of his time and expertise to his local community and future students. This past summer, Professor Burzo volunteered his time at the second annual Girls in Engineering, Math, and Science (GEMS) summer camp. He has mentored elementary school students for the Science Olympiad for the past two years, and has participated for four years in the university's Super Science Friday for middle school students. In 2016, Professor Burzo organized a UM-Flint Engineering Summer Camp (for middle school students) and has mentored two high school FIRST Robotics teams.

External Reviewers:

Reviewer (A): “Dr. Burzo has made notable research contributions to the problem of human deception detection, i.e., the problem of identifying whether a human is telling the truth or lies... Dr. Burzo has proposed several novel solutions to this problem, using multimodal features stemming from verbal communication, video, and thermal imaging. These results have firmly established Dr. Burzo as a research leader on this topic.”

Reviewer (B): “Also, he has ventured into thermal discomfort detection in climate-controlled ground vehicles...In my opinion, this shows Dr. Burzo's ability to adapt his research to his available resources and local needs and interests.”

Reviewer (C): “I am impressed with the research that Professor Burzo has been able to do while maintaining a high teaching load.”

Reviewer (D): “His work on thermo-reflectance based measurements is solid and has been extensively cited...I can still safely state that the quality of his early work on thermo-reflectance is at par with some of the best today.”

Reviewer (E): “His most cited publications (with over fifty citations each) are related to the measurement of thermal properties of materials employing a transient thermo-reflectance method. His most recent work, on the use of thermal imaging for characterization of human behavioral expressions, has been gaining considerable attention.”

Reviewer (F): “The most fascinating aspect of Dr. Burzo’s scholastic record is the highly successful transformation from a heat transfer researcher to a behavioral researcher, focused on questions of deception detection... All these are signs of a highly creative and bold researcher who keeps expanding his operational envelope.”

Reviewer (G): “Prof. Burzo is well-recognized for his important publications on the development of experimental and numerical techniques for applications of thermal imaging methods in microelectronics, material science and physiological sensing of behavioral patterns and thermal state of human subjects.”

Summary of Recommendation:

Professor Burzo’s record of two book chapters, one peer reviewed journal article, and twenty peer reviewed conference proceedings, as well as over \$1.5 million in grant support from such prestigious funding agencies as the National Science Foundation and the Toyota Research Institute clearly establish him as a leading scholar in his field. Professor Burzo is also a skilled and dedicated teacher who seamlessly integrates the pedagogical principals of active learning, cross-disciplinary teaching and integration of content knowledge, the utilization of illustrative examples, and the application of educational technology to help communicate theoretical and abstract concepts. His extraordinary engagement in mentoring students in research and independent studies stands as a testament to his student-centeredness. Professor Burzo has amassed an impressive record of service in his department, college, university and professional and local communities. He has demonstrated the requisite excellence in teaching, scholarly achievement and recognition, and service to his community, university and department. I recommend that Mihai Burzo for promotion to associate professor of engineering, with tenure, Department of Computer Science, Engineering, and Physics, College of Arts and Sciences.

Recommended by:

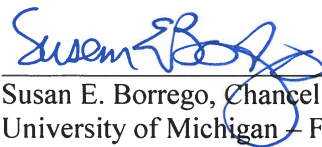


Susan Gano-Phillips, Dean
College of Arts and Sciences

Recommendation endorsed by:



Susan E. Alcock, Interim Provost and
Vice Chancellor for Academic Affairs



Susan E. Borrego, Chancellor
University of Michigan – Flint

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