Approved by the Regents
May 17, 2012

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Nikolaos Chronis, assistant professor of mechanical engineering, Department of Mechanical Engineering, assistant professor of biomedical engineering, Department of Biomedical Engineering, and assistant professor of macromolecular science and engineering, Macromolecular Science and Engineering Program, College of Engineering, is recommended for promotion to associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, and associate professor of macromolecular science and engineering, without tenure, Macromolecular Science and Engineering Program, College of Engineering.

Academic Degrees:

Ph.D.	2004	University of California, Berkeley, Mechanical Engineering, Berkeley, CA
B.E.	1998	Aristotle University of Thessaloniki, Mechanical Engineering, Greece

Professional Record:

2011 – present	Assistant Professor, Macromolecular Science and Engineering Program, University of Michigan
2006 – present	Assistant Professor, Department of Mechanical Engineering, University of Michigan
2006 – present	Assistant Professor, Department of Biomedical Engineering, University of Michigan
2004 – 2006	Postdoctoral Researcher, Rockefeller University, NY

Summary of Evaluation:

Teaching: Professor Chronis has taught three undergraduate core courses in the ME department: ME 320, an introductory undergraduate course in Fluid Mechanics, ME 395, an undergraduate laboratory course, and ME 450, a capstone design/manufacturing class. He has taught ME 553, a graduate-level course in Micro-Electro-Mechanical Systems, and developed a new interdisciplinary graduate course in BioMEMS and Microfluidics (ME599/ ChE696). His teaching evaluations have greatly improved since he first joined Michigan, reflected by the recent Q1 and Q2 scores consistently above 4.0 for his undergraduate and graduate courses. Students praise his knowledge, passion and compassion as a teacher and his willingness to help.

Professor Chronis has graduated one Ph.D. and five M.S. students and is presently advising three additional Ph.D. students. Letters from his graduate students show that he is a very effective advisor who is well-respected and liked. His mentorship is also demonstrated through his publications with his graduate students. In addition, Professor Chronis has been actively involving undergraduate students in research; several undergraduate students have gained research experience through working in his lab.

Research: Professor Chronis is an outstanding scholar and a rising star in the neuro-science and neuro-engineering field. He has created novel BioMEMS devices to address fundamental issues in neuro-science and to provide diagnostic tools in the medical field, and has become a leading expert in this emerging area. Professor Chronis has demonstrated a high level of academic excellence and research competency, evidenced by his Ph.D. thesis work, his postdoc experience, and his performance here at Michigan. Professor Chronis has developed a strong research program at Michigan. He is a PI or co-PI on several NIH grants. He was recently awarded with prestigious NIH Director's New Innovator Award for his research on

"*A Biochip for Point-of-Care HIV/AIDS Diagnosis in the Developing World.*" This is a research idea that will greatly impact our world.

Professor Chronis had published five journal papers before arriving at Michigan. Since joining his department, he has published 13 journal articles in top quality and high impact journals, including *Nature* and *Nature Methods*. His journal papers have been cited over 700 times, with an *h-index* of 13; this is an impressive record for a person at this stage of his career. Moreover, the microfludics technology developed in Professor Chronis' group is now providing engineering know-how to other research labs worldwide. He has therefore been consulting with his peers and providing them with microfluidic chips, another clear demonstration of the impact of his work.

Recent and Significant Publications:

Chokshi T.V., Bazopoulou D., and Chronis N., "An automated microfluidic platform for calcium imaging of chemosensory neurons in Caenorhabditis elegans," *Lab Chip*, 10(20):2758-63 (2010).

Chronis N., "Worm Chips: Microtools for C. elegans Biology," *Lab Chip*, 2010, 10, 432-437.

Ben-Yakar A., Chronis N., and Lu H., "Microfluidics for the analysis of behavior, nerve regeneration, and neural cell biology in worms," *Current Opinion in Neurobiology*, Oct;19(5):561-7 (2009).

Tripathi A., Chokshi T.V., and Chronis N., "A high numerical aperture, polymer-based, planar microlens array," *Optics Express*, Vol. 17 Issue 22, pp.19908-19918 (2009).

Zimmer M., Gray J.M., Pokala N., Chang A.J., Karow D.S., Marletta M.A., Hudson M.L., Morton, D.B., Chronis N., and Bargmann C.I., "Neurons Detect Increases and Decreases in Oxygen Levels Using Distinct Guanylate Cyclases," *Neuron*, Volume 61, Issue 6, 865-879, 26 March 2009.

Choskshi T.V., Ben–Yakar A., and Chronis N., "CO2 and Compressive Immobilization of C. elegans on-chip," *Lab Chip*, 2009, 9, 151-157.

Lockery S., Lawton K., Doll J.C., Faumont S., Coulthard S., Thiele T., Chronis N., McCormick K., Goodman MB., and Pruitt BL., "Artificial dirt: Microfluidic substrates for nematode neurobiology and behavior," *Journal of Neurophysiology*, vol. 99: 3136-3143, (2008).

Chalasani S., Chronis N., Tsunozaki M., Gray J., Goodman M., and Bargmann C., "Dissecting a neural circuit for food-seeking behavior in Caenorhabditis elegans," *Nature*, 450, 63-70 (2007).

Chronis N., Zimmer M., and Bargmann C.I., "Microfluidics for in vivo imaging neuronal and behavioral activity in Caenorhabditis elegans," *Nature Methods*, vol.4, no.9, September 2007, p. 727-731.

Chang A.J., Chronis N., Karow D.S., Marletta M.A., and Bargmann C.I., "A Distributed Chemosensory Circuit for Oxygen Preference in C. Elegans," Public Library of Science (PLoS) *Biology* Vol. 4, No. 9, (2006).

Service: Professor Chronis has been a good citizen in serving the University of Michigan. He has served on Mechanical Engineering's Honors and Awards Committee, Graduate Program Committee, and Faculty Search Committee, and was on a college-level task force on the FXB building lab renovation. In terms of external service, he has served as a reviewer for various journals, conferences, and NSF. In 2009, he organized a workshop at the 17th Worm International Meeting entitled "Microfluidic Approaches to the Analysis of Behavior, Physiology, and Development in C. elegans." In addition, he has been serving as a guest editor for the special issue entitled "Neural Engineering" for the *Journal of Bioengineering and Biomedical Science*.

External Reviewers:

Reviewer A: "...he is well known in his field and shows signs of excellent leadership capabilities."

Reviewer B: "His research success shows how creative and broad Nikos is...he is fearless."

Reviewer C: "Nikos is a rising star in the bio-microfluidics technology community..."

Reviewer D: "His vision and results have generated a sense of great excitement in the community, which is energizing the next generation of microfluidic researchers…"

Reviewer E: "He has become the best-known researcher in the area of using microfluidic tools for dissecting C. elegans pathways and has authored numerous high-quality and high-impact papers."

Summary of Recommendation: Professor Chronis is an outstanding scholar and a rising star in the field of neuro-science and neuro-engineering. The quality and potential impact of his research is highly praised by his peers. Professor Chronis is a well-respected and effective teacher and is a great advisor to students. He has also contributed to the UM and the professional communities with a wide variety of service activities. It is with the support of the College of Engineering Executive Committee that I recommend Nikolaos Chronis for promotion to associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, and associate professor of macromolecular science and engineering, without tenure, Macromolecular Science and Engineering Program, College of Engineering.

David C. Munson Jr.

David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

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