

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Ilya V. Kolmanovsky, professor of aerospace engineering, without tenure, Department of Aerospace Engineering, College of Engineering, is recommended for the granting of tenure to be held with his title of professor of aerospace engineering, Department of Aerospace Engineering, College of Engineering.

Academic Degrees:

Ph.D.	1995	University of Michigan, Aerospace Engineering, Ann Arbor
M.A.	1995	University of Michigan, Aerospace Engineering, Ann Arbor
M.S.	1993	University of Michigan, Aerospace Engineering, Ann Arbor
	1990	Moscow Aviation Institute, Faculty of Astronautics and Automatic Flying Vehicles, Moscow, Russia

Professional Record:

2010-present	Professor (without tenure), Department of Aerospace Engineering, University of Michigan
2003-2009	Adjunct Associate Research Scientist, Department of Mechanical Engineering, University of Michigan
2001-2009	Technical Leader in Powertrain Control Systems and Group Manager, Ford Motor Company, Dearborn, Michigan
1996-2001	Technical Specialist in Powertrain Control Systems, Ford Motor Company, Dearborn, Michigan

Summary of Evaluation:

Teaching: Professor Kolmanovsky has established himself as an effective and dedicated educator. He has taught four different courses, three graduate and one undergraduate, in five semesters. He also developed a new course in AERO 347 and modified AERO 573 and AERO 575 by developing new course materials. Professor Kolmanovsky is extremely active in advising graduate students in a broad range of research project. He has been a co-advisor for three past doctoral students and he is chair or co-chair for another eight. Professor Kolmanovsky has advised 11 M.S. students and mentored four post-doctoral fellows.

Research: Professor Kolmanovsky's research contributions are notable for their impact on subsequent research. According to Google Scholar, he has published papers that have been cited 887 times (1995 paper); 258 times (1998 paper); 104 times (1999 paper); 113 times (2000 paper); and 99 times (2002 paper). According to the Web of Science, his h-index is 21. He is an internationally recognized expert in powertrain control through extensive contributions at Ford Motor Company, as documented by his recognition as an inventor or co-inventor on 86 patents. In addition, he has established a reputation for transitioning novel concepts and techniques in control theory to practical application, for example, nonlinear model predictive control for hybrid electric vehicles. He currently has projects with both Ford Motor Company and Toyota on related projects.

Upon joining the University of Michigan, Professor Kolmanovsky rapidly established research projects relating to aerospace engineering and technology. For example, he spent two summers at the Air Force Research Laboratory in Albuquerque, NM, where he researched spacecraft control strategies for rendezvous, docking, and collision avoidance. These visits led to a funded project.

Professor Kolmanovsky has an extraordinarily strong publication record. He has more than 70 journal articles, many published in top-tier journals, as well as more than 220 articles in refereed conference proceedings.

Recent and Significant Publications:

- Li, S., Kolmanovsky, I.V. and Ulsoy, G., "Distributed supervisory controller design for battery swapping modularity in plug-in hybrid electric vehicles," *ASME Journal of Dynamic Systems, Measurements and Control*, vol. 134, July, 2012.
- Yildiz, Y. and Kolmanovsky, I.V., "Stability properties and cross coupling performance of the control allocation scheme CAPIO," *AIAA Journal of Guidance, Control and Dynamics, Journal of Guidance, Control, and Dynamics*, vol.34, no.4, pp. 1190-1196, July-August, 2011.
- Gilbert, E. and Kolmanovsky, I.V., "Nonlinear tracking control in presence of state and control constraints: A generalized reference governor," *Automatica*, vol. 38, no. 12, pp. 2063-2073, 2002.
- Reyhanoglu, M., van der Schaft, A., McClamroch, N.H. and Kolmanovsky, I.V., "Dynamics and control of a class of underactuated mechanical systems," *IEEE Transactions on Automatic Control*, vol. 44, no. 9, pp. 1663-1671, September 1999.
- Stefanopoulou, A. and Kolmanovsky, I.V., "Analysis and control of transient torque response in engines with internal exhaust gas recirculation," *IEEE Transactions on Control Systems Technology*, vol. 7, no. 5, pp. 555-566, September 1999.
- Kolmanovsky, I.V. and McClamroch, N.H., "Stabilizing feedback laws for internally actuated multibody systems in space," *Nonlinear Analysis: Theory, Methods and Applications*, vol. 26, no. 9, pp. 1461-1479, May 1996.

Service: Professor Kolmanovsky has been extensively involved in service both inside the university and externally. He has served as a member of the Board of Governors of the IEEE Control Systems Society and an associate editor for several of the top-tier journals in the controls field. Since joining the University of Michigan, he has expanded his service activities to membership on several College of Engineering Committees (International Programs, Awards, and Control Seminar) and several committees within the Department of Aerospace Engineering (Graduate, Undergraduate, and Faculty Search Advisory).

External Reviewers:

Reviewer A: "His eminent qualifications are evident from the curriculum vitae you sent me. They should immediately qualify him for tenure at any department at any university in the world."

Reviewer B: "Dr. Kolmanovsky is one of the world's most distinguished researchers in the field of automotive control, especially in the control of powertrain systems...Dr. Kolmanovsky's work has defined the literature in this area....His research funding shows an excellent combination of industrial projects and fundamental research projects obtained from government agencies."

Reviewer C: "I believe he has made substantial creative contributions throughout his career, and has risen to a level of significant national and international recognition for his work."

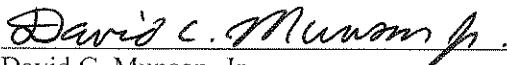
Reviewer D: "Furthermore, having worked with one foot in both the theoretical and applied research communities for almost fifteen years now, I must also point out how rare it is for a researcher in an industrial/applied setting to strive to develop rigorous, new theory to attack the problems presented by particular applications rather than simply harvesting approaches from the literature and applying them..."

Reviewer E: “During his years at Ford, Dr. Kolmanovsky did some of the best work I have seen in applying control ideas to difficult real-world problems (the internal combustion, reciprocating engine is one of the most difficult plants to control, in my opinion), taking powerful theoretical concepts all the way to vehicle implementation, and towards commercial production. His record of scholarly publications during his years at Ford is a testament to his dedication to scholarship, in addition to his obvious success as an industrial practitioner...he has successfully developed a research program that has a strong aerospace component, while still maintaining an interest in automotive control problems.”

Reviewer F: “...what I consider his highest impact accomplishment is to bring very advanced scientific ideas into concrete applications...”

Reviewer G: “I am very impressed by Ilya’s transition from a successful industrial research career to an equally successful academic career.”

Summary of Recommendation: Professor Kolmanovsky is a pre-eminent and highly respected researcher in both the theory and practice of control system technology. He has demonstrated strong and effective teaching abilities at both the undergraduate and graduate levels, and he is currently advising and mentoring a large group of graduate students and postdoctoral researchers. It is with the support of the College of Engineering Executive Committee that I recommend Ilya V. Kolmanovsky for the granting of tenure to be held with his title of professor of aerospace engineering, with tenure, Department of Aerospace Engineering, College of Engineering.



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

May 2013