

FOREWORD

In the last several years, the Industrial & Manufacturing Engineering Department has dramatically improved the quality of the research being conducted by its doctoral students. We are extremely delighted and proud to share these results through this inaugural Graduate Research Symposium held on April 21, 2005. Herein, sixteen articles written by our doctoral students and recent graduates are presented on a variety of topics relevant to the field of industrial and manufacturing engineering.

This symposium has been possible by improving our admission standards as well as the program standards and requirements. I briefly describe few notable changes in the way we mentor our doctoral students as well as report on some of our recent research initiatives. Over the last few years, the students and the faculty have formed two large active research groups in the areas of Supply Chain Management and Product Development. Both of these groups are meeting bimonthly to discuss literature, share research methods, seek feedback, and present results. Besides improving camaraderie among students and faculty, these research group meetings improve our students' ability to conduct quality research at a productive pace. Similar smaller groups are forming in other areas as well. Some notable research efforts in recent years include research on autonomous diagnostics and prognostics for condition-based maintenance by several doctoral students in collaboration with Ford Motor Company and with funding from the National Science Foundation. Intelligent manufacturing research, in particular, intelligent resistance welding, has also been pursued successfully in collaboration with Ford Motor Company. We currently have doctoral students working in collaboration with Ford Motor Company to improve the productivity of manufacturing plants, in particular automotive power-train plants, through advanced modeling and techniques for management/optimization of bottlenecks. Building on the leadership projects that are an integral part of our elite Engineering Management Masters Programs (EMMP) offered exclusively to Ford Motor Company and Visteon Corporation, many of our doctoral students have also been able to address a variety of challenging issues facing the automotive industry. Few notable topics include risk management in global sourcing, assessing the performance of manufacturing operating systems, viability of regional/focused assembly plants, capital investment models for equipment replacement in engine plants, processes for diffusion of best practices, and models for assessing the benefits of component commonality in automotive platforms.

Upon graduation, most of our doctoral students are now publishing multiple articles in scholarly journals and presenting these results at national and international conferences. These proceedings are a testament to this progress. Our aim is to improve further the quality of this research through better coursework and active collaboration with industry on seeking out challenging technical problems and delivering real-world solutions.

We also hope that the Graduate Research Symposium and its proceedings will offer an opportunity for more interaction between the department's doctoral student community, its faculty, and peers from academia and industry to find out better ways to address current research problems as well as problems of the future.

We look forward to making this an annual event and welcome your participation in this and future events!

Best Regards,



Dr. Ratna Babu Chinnam
Graduate Chair, Industrial & Manufacturing Engineering Department

