Preface

We never create anything,
We discover and reproduce.

The Twelfth International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems has a distinguished theme. It is concerned with bridging the gap between the academic and the industrial worlds of Artificial Intelligence (AI) and Expert Systems. The academic world is mainly concerned with discovering new algorithms, approaches, and methodologies; however, the industrial world is mainly driven by profits, and concerned with producing new products or solving customers' problems. Ten years ago, the artificial intelligence research gap between academia and industry was very broad. Recently, this gap has been narrowed by the emergence of new fields and new joint research strategies in academia. Among the new fields which contributed to the academic-industrial convergence are knowledge representation, machine learning, searching, reasoning, distributed AI, neural networks, data mining, intelligent agents, robotics, pattern recognition, vision, applications of expert systems, and others. It is worth noting that the end results of research in these fields are usually products rather than empirical analyses and theoretical proofs. Applications of such technologies have found great success in many domains including fraud detection, internet service, banking, credit risk and assessment, telecommunication, etc. Progress in these areas has encouraged the leading corporations to institute research funding programs for academic institutes. Others have their own research laboratories, some of which produce state of the art research.

As this conference marks the end of the 20th century and the beginning of a new century, we have to think very seriously about this problem, which exists in fields that are less demanding on our daily life. It is true that the most important factor of the academic-industrial convergence is the individual demand for technology. For example, medical research, automobile research, and food research are closely associated with the industrial world. Moreover, the success of such research depends highly on the products produced. For this reason, it has been more difficult to achieve academic-industrial convergence in mathematical research and other pure science fields.

The industrial world of artificial intelligence is growing rapidly. A very high percentage of today's corporations utilize AI in their products. We expect by early next century, AI will be embraced in some way in all machinery products. It is our view that as this becomes true, academic-industrial research will increasingly converge. Most current attempts to converge academic-industrial research cover only one type of convergence. The other possible alternative is to utilize AI for enhancing demanded products rather than building AI products to be demanded. To achieve such approach of convergence, competent management is necessarily needed. There are

many advantages and disadvantages on both sides. We list some of them here to be considered, enhanced, or ignored.

Advantages:

- Upgrading technology in industry is usually driven by customer needs.
- Research in academia is mature and competition is very comprehensive.
- The technology installment in industrial corporations is usually based on academic research.

Disadvantages:

- Competitive marketing forces corporations to hide their technology.
- Publications have no effect on carrier advancement in industry, and in many cases, it is prohibited.
- Fulfilling a graduate degree or earning a promotion often drives the advance of technology in academia.
- Even though the technology installment in industry is usually based on academic research, industrial technology rarely follows the state of the art in academic research.
- The requirements of the Doctoral of Philosophy degree do not include any industrial standards.

Recommendations:

Finally, here are our recommendations for such convergence:

- Increasing the industrial support to academic research.
- Introducing a new Doctoral degree (not in philosophy) that is oriented toward solving real world-problems.
- Educating conference organizers to allow research that hides industrial technology, which may influence the market (an on-site demo may be requested in return).
- Computer Science Departments should require industrial involvement in all graduate advisory committees and prepare an industrial oriented program for corporate employees.
- Industrial corporations should encourage their employees to complete their graduate study.

The 12th International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems (IEA/AIE-99) attracted many researchers and engineers from all over the world. Over 140 papers were submitted to the conference. These proceedings contain 91 papers from 32 countries. Most of the papers in this volume present applications in domains that are mentioned above. It is worth mentioning that one third of the papers in this volume are concerned with Intelligent Agents, Expert Systems, and Pattern Recognition. One can notice the

strong presence of academia. This may also reflect the growing rate of industrial applications in academia.

On behalf of the organizing committee, we would like to thank all those who contributed to the 12th International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems. We would like to thank the program committee members for their valuable assistance in reviewing the submitted papers. We would like to extend our thanks to the auxiliary reviewers. We thank Nihal Abosaif for her assistance in editing these proceedings, and reviewing their contents. We would like to thank Cheryl Morriss for handling the administration aspects of the conference. We thank Vladan Devedzic, Hans W. Guesgen, Howard Hamilton, Gholamreza Nakhaeizadeh, Michael Schroeder, and Jan Treur for their professional organizational effort.

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