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PREFACE

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In addition to teaching and service functions, King Mongkut's University of Technology Thonburi (KMUTT) regards research activities as one of its most important roles. As envisaged in one of KMUTT's visions approved by the University Council, "Determined to be at the Forefront of Technology and Research", the University is determined to be a higher education institution outstanding in the field of research, development and selection of suitable technology for the Thai economic and social context to create a happy Thai society competitive in the global community.

This forth collection of 799 KMUTT Research Abstracts for the year 2004 is one of the activities intended to support the above vision. These abstracts are also available through electronic access at website: www.kmutt.ac.th and the full papers of theme have been published in a variety of international and regional journals and proceedings.

I would like to extend my sincere thanks to all KMUTT researchers and administrative staff for their support, and for making this publication be of interest and benefit to the public and research communities.

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