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Proceedings of the 5th Brazilian Technology Symposium

Emerging Trends, Issues, and Challenges
in the Brazilian Technology, Volume 1

 Springer

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Foreword

It is with great satisfaction that I write this foreword to the book, Proceedings of the 5th Brazilian Technology Symposium (BTSym'19), held at the Mackenzie Presbyterian University, SP, Brazil, in October 2019. This event is in its fifth edition and has consolidated to become an excellent opportunity for researchers, teachers, and students to present and discuss the results of their research works.

The 2019 edition of BTSym is characterized by the broad scope of exposed areas, with papers dealing with current and important topics for Brazilian and world technological development, including subjects related to the various branches of human, engineering, smart and sustainable future of cities, architecture, biomedical and computer science.

Events such as BTSym are an essential part of the research and innovation process. Firstly, these events contribute to the promotion of research activities, which are key to a country's technological development. The dissemination of research results, as promoted by BTSym, contributes to the transformation of research findings into technological innovation. In addition, these events facilitate the sharing of findings, eventually leading to the formation of research networks, which accelerate the achievement of new results.

Therefore, I congratulate the BTSym General Chair, Prof. Dr. Yuzo Iano, and his group of collaborators for the important initiative of organizing the BTSym 2019 and for providing the opportunity for authors to present their work to a wide audience through this publication.

Finally, I congratulate the authors for the high-quality research papers and scientific experiments presented in this proceedings.

Best wishes,
Ana Carolina Borges Monteiro
Researcher and Associate-Editor
University of Campinas
Campinas, Brazil

Preface

This book contains the Proceedings of the 5th Brazilian Technology Symposium, an event held in Campinas, SP, Brazil, in October 2019. This book was divided into two parts: the first part on Emerging Trends in Systems Engineering and Telecommunications and the second part on Emerging Trends in Industry 4.0, Smart and Sustainable Future of Cities.

The Brazilian Technology Symposium is an excellent forum for presentations and discussions of the latest results of projects and development research, in several areas of knowledge, in scientific and technological scope, including smart designs, sustainability, inclusion, future technologies, architecture and urbanism, computer science, information science, industrial design, aerospace engineering, agricultural engineering, biomedical engineering, civil engineering, control, and automation engineering, production engineering, electrical engineering, mechanical engineering, naval and oceanic engineering, nuclear engineering, chemical engineering, probability, and statistics.

This event seeks to bring together researchers, students, and professionals from the industrial and academic sectors, seeking to create and/or strengthen the linkages between issues of joint interest. Participants were invited to submit research papers with methodologies and results achieved in scientific-level research projects, completion of course work for graduation, dissertations, and theses.

The 60 full chapters accepted for this book were selected from 210 submissions, and in each case, the authors were shepherded by an experienced researcher, with a rigorous peer review process. Among the main topics covered in this book, we can highlight natural language processing, artificial neural network, physical ergonomics, blockchain, communication technologies, Industry 4.0, computational intelligence, fuzzy logic, mentoring process, molecular interactions, fermentation process, simulation, digital image processing, pattern recognition, machine learning, magnetic field visualization, frameworks developments, physiological parameters applications, computational vision, data science, spatial-temporal parameters, measuring system, sensory analysis, precision agriculture, electrocardiogram, autonomic nervous system, content analysis, statistical process control, measurement uncertainty, model predictive control, IoE, IoT, smart cities, electrical

installations, photocatalysis, X-ray, lexical tone, industrial environment, workstations, sensors, autonomous cars, PCB, data privacy, fluid dynamics, HPV, quantum computing, and much more.

We hope you enjoy and take advantage of this book and feel motivated to submit your papers in the future to Brazilian Technology Symposium.

Campinas, Brazil

Best wishes,
Reinaldo Padilha França
Proceedings Chair of Brazilian
Technology Symposium

Acknowledgments

Our appreciation goes to a lot of colleagues and friends who assisted in the development of this book, Proceedings of the 5th Brazilian Technology Symposium (BTSym'19).

First of all, I would like to thank all the members of the Organizing and Executive Committee, for the commitment throughout the year, several meetings were held, and many challenges were overcome for the accomplishment of the BTSym 2019.

Also, and with great merit, I would like to thank all the members of the Scientific and Academic Committee and Technical Reviewers Committee, for their excellent work, which was essential to ensure the quality of our peer review process, and collaborating with the visibility and technical quality of the BTSym 2019.

The Brazilian Technology Symposium is an event created by the Laboratory of Visual Communications of the Faculty of Electrical and Computer Engineering of the University of Campinas (UNICAMP). In this way, I would like to thank the Mackenzie Presbyterian University, especially for the support and hosting of the BTSym 2019, which was critical for the success of their accomplishment.

Beta Telecommunications played a crucial role in holding the BTSym 2019, in the same way as the Pro-Rector of Extension and Culture at the University of Campinas, especially Prof. Fernando Augusto de Almeida Hashimoto, due to financial support from it, and it was possible to consolidate with quality many BTSym 2019 organization aspects, which ensured the quality to support the authors and speakers.

Finally, I thank all the authors for their participation in the BTSym 2019, I sincerely hope to have provided an experience that was very useful and enriching in the personal and professional lives of everyone, and my special thanks go to Prof. Rangel Arthur. Due to the continuous support in activities that enrich the academic environment through research directed to innovative technological development.

He is a generous, charismatic, dedicated, determined, and fair person, being an excellent fellow in academic research that certainly contributes a lot to BTSym, who has a lot to thank Prof Rangel Arthur for.

Best wishes,
Prof. Yuzo Iano
General Chair of Brazilian
Technology Symposium

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