Multi-faceted systems of the future will entail complex logic and reasoning with many levels of reasoning in intricate arrangement. The organization of these systems involves a web of connections and demonstrates self-driven adaptability. They are designed for autonomy and may exhibit emergent behavior that can be visualized. Our quest continues to handle complexities to design and operate these systems. The challenge in Complex Adaptive Systems design is to create an organized complexity that will allow a system to achieve its goals.

Complex Adaptive Systems have dynamically changing meta-architectures. Finding an optimal architecture for these systems is a multi-criteria decision making problem often involving many objectives in the order of 20 or more. This creates “Pareto Breakdown” which prevents ordinary multi-objective optimization approaches from effectively searching for an optimal solution; saturating the decision maker with large set of solutions that may not be representative for a compromise architecture selection from the solution space.

These systems will impact the manufacturing industry, defense, healthcare, energy, transportation, emergency response, agriculture and society overall. The success will come based on how the current challenges related to cybersecurity, interoperability, privacy, safety and socio-technical aspects, mainly interaction of human behavior, and Complex Adaptive Systems are handled. Researchers from academia, industry and government met in Los Angeles, California, in November 2016, to share their findings and expand the boundaries of research in Complex Adaptive Systems. This year we are centered on the current state of practice in applying the theory of Engineering Cyber Physical Systems in real life.
This publication of the Complex Adaptive Systems Proceedings series contains the edited versions of the technical presentations of Complex Adaptive Systems conference held November 2-4, 2016, in Los Angeles, California, U.S.A. The extended version of each selected paper was reviewed by two referees, then revised, edited and condensed to the format herein. The proceedings have four parts: Cyber Physical Systems, Intelligent and Adaptive Systems, Data Science and Analytics, Complex System Modelling. I would like to express my gratitude to the plenary speakers at the conference for their invaluable contributions through their talks. Speakers included: Dr. Joshua Baron of Rand Corporation, Dr. Anna-Maria R. McGowan of NASA, Ms. Göknur SIRIN-JUBIN of Renault France from Research and Development Department, and Dr. Fei-Yue Wang of Chinese Academy of Sciences. Further, I wish to express my gratitude to all authors for their contributions to this volume of proceedings and for their presentations at the conference, as well as, to all referees for their comments and suggestions for revising the papers. I would like to mention our appreciation to the conference sponsors for bringing real life dimension, issues and engineering problems to the meeting. I would also like to thank Lisa A. Strauser, Audra E. Alexander, Sue Turner and Latesha Zach from Missouri S&T’s Distance & Continuing Education department, for all their help and efforts that enabled me to sail smoothly in the organization of this conference and production of this volume.

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