

Workshop for Modularity for Sustainability, 2015 Ft. Collins, Colorado, March 17, 2015

Post-Workshop Information

Organizers:

- *Jean-Michel Bruel*, University of Toulouse, France
- *Betty HC Cheng*, Michigan State University, USA
- *Benoit Combemale*, INRIA and Univ. of Rennes, France
- *Jeff Gray*, University of Alabama, USA
- *Ana Moreira*, Universidade Nova de Lisboa, Portugal

and the original force behind this workshop,

Robert France, CSU Professor (Oct. 8, 1960-Feb. 15, 2015)

Objective: The objective of this workshop was to explore the software engineering, model-driven engineering, and modularity research challenges associated with supporting sustainability activities. Sustainability applications such as smart grid, smart agricultural systems, water management systems, etc., all involve numerous monitoring devices and onboard control systems to govern their adaptive behavior. These systems share the overarching objective of making efficient use of limited resources for the sustainability of Earth and her resources. Given the three major competing factors: environmental impact, economic impact, and social impact, extensive computing-based support is needed to manage these adaptive systems, provide decision-support that requires the integration of disparate data-intensive models, and provide the computational resources to analyze the data. As such, this 1-day workshop explored several of these challenges, starting with a tour of the Colorado State University Powerhouse Institute, a world-class sustainability research facility housing 13 sustainability-based research centers, numerous industrial sustainability-focused organizations, and unique research laboratory facilities. Next, Professor Siddharth Suryanarayanan, Director of Advanced Power Engineering Lab (APEL), Electrical and Computer Engineering, Colorado State University provided an illuminating keynote titled ``A Sustainability-Based Approach to Resource Allocation in the Smart Grid''. The tour and the keynote provided a wonderful platform of domain knowledge for the workshop participants to address three key questions during the afternoon breakout sessions:

- What are compelling scenarios and/or applications for sustainability
- What are Emerging Research Challenges for the scenarios
- What are Enabling technologies needed
 - From our community
 - From other disciplines (e.g., control theory, machine learning, biology, psychology, etc.)

The slides from the workshop opening, keynote, and the breakout sessions provide a concise summary of the key workshop activities.

At the conclusion of the workshop, it was agreed that this area of research is ripe with numerous challenges for the SE/MDE/Modularity community. The workshop attendees were enthusiastic to continue to explore the challenges and work together to further develop contributions to advance this field of study.

As a side note, this workshop has complementary objectives to other sustainability workshops, such as [GREENS](#) and [SE4S](#) (focus on how to develop software that is resource-aware and resource-conserving), and [RE4SuSy](#) (Requirements Engineering for Sustainable Systems), focusing on “why and how social and environmental sustainability impact RE practices”.