Guest Editorial

Welcome to this Special Issue of the *ACM Transactions on Storage*. This issue covers the best papers from the Research Track of the 27th IEEE Symposium on Mass Storage Systems and Technologies (MSST), held in Denver, Colorado, in May 2011. The MSST symposium dedicated a full week to storage technology and included one day of tutorials, two days of invited papers, and two days of peer-reviewed research papers. Following the model of the successful 2010 event, MSST 2011 made a clear distinction between invited papers, covering current and future problems and solutions in mass storage environments, and the Research Track, which focused on analyzing storage systems and pushing the state of the art.

We were delighted that the Research Track grew to attract more high-quality submissions. It received 62 paper submissions from which 15 full papers were accepted. Each paper received at least three reviews from the program committee which was comprised of a total of 31 members. We want to thank all the researchers who submitted manuscripts; it would have been impossible to provide such an interesting program without these submissions. We also thank the PC members, the external reviewers, and the MSST steering committee members. Each of them voluntarily invested a lot of time to make MSST 2011 a successful conference.

Six technical sessions formed the core of the program, reflecting a diverse set of existing challenges and research insights. Besides the presentation of best papers, highlights of MSST 2011 included the keynote from Mary G. Baker on digital preservation (in other words, "Preserving Bread Crumbs") and a panel on how to do good research in storage that featured David Du, Ethan Miller, Sean Roberts, and Brent Welch as panelists. The discussion showed that even though storage research is already well established, there are still many challenges in making it comparable to other fields as well as in finding the right balance between high-risk research and producing enough results (especially as Ph.D. students). Furthermore, the importance of negative results should be better recognized in storage research as in other areas. (See storageconference.org for a panel summary).

The two MSST best papers covered related problems from different perspectives. First, it is necessary to understand (and sometimes to change) application behavior before storage systems can be designed to support their requirementss. Solutions like the one presented in "Understanding and Improving Computational Science Storage Access through Continuous Characterization" by Carns et al. will help to overcome the challenges inherent in moving towards Exascale computing. Then, even if the behavior of individual applications is well understood, it is still necessary to provide quality-of-service techniques that let applications interact in a predictable way on shared storage systems. These techniques could, for example, be based on the concept of a reference storage system as proposed in "YouChoose: Choosing your Storage Device as a Performance Interface to Consolidated I/O Service" by Zhang et al.

We hope that you enjoy these articles and find them as interesting as we did.

—André Brinkmann and David Pease
MSST 2011 Research Track
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