

# Special Session at DSN for the Best Papers from SELSE 2018

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**Abstract**—The 14th Workshop on Silicon Errors in Logic – System Effects (SELSE) was held on April 3-4, 2018, in Boston, MA, USA. Detailed information about SELSE 2018 and previous SELSE workshops, including links to presentations, is available at <http://www.selse.org>. Three papers were selected as the Best of SELSE papers and are presented in this special DSN session.

**Keywords**— *Soft errors, hard errors, logic errors, uncorrectable errors, unrecoverable errors, error mitigation, error models, error-handling protocols, resilience, failure data.*

## I. INTRODUCTION

The Silicon Errors in Logic – System Effects (SELSE) workshop was originally created as a forum to discuss current and future trends in soft errors, their impact on computing systems, and effective techniques for addressing them. Over the years, the scope of SELSE has been expanded to encompass a larger array of reliability topics, including other types of silicon errors as well as reliability issues in non-silicon, emerging technologies, and reliability issues across a wide spectrum of application domains and market segments, from embedded (e.g., automotive) to warehouse-scale systems. The span of topics covered at SELSE is very diverse: it includes every layer of design, from devices to systems, exploring reliability issues in various designs including CPUs, GPUs and FPGAs. The SELSE audience is equally broad and diverse, encompassing industry, academia (faculty and students), and government research labs.

Key areas of interest at SELSE include (but are not limited to):

- Technology trends and the impact on error rates.
- New error mitigation techniques.
- Characterizing the overhead and design complexity of error mitigation techniques.
- Case studies describing the tradeoff analysis for reliable systems.
- Experimental data on failures in current and emerging technologies.
- System-level models: derating factors and validation of error models.
- Error handling protocols (higher-level protocols for robust system design).
- Characterization of reliability of systems deployed in

the field and mitigation of issues.

- Software-level impact of hardware failures.
- Software frameworks for resilience.
- Impact of machine learning components on system resilience.
- Resilient accelerator-rich systems.

## II. DSN SPECIAL SESSION

The attendees at both SELSE and DSN are usually members of the dependability community, and the papers presented at the SELSE Workshop cover topics of interest to the DSN attendees. Building on this synergy, this special session at DSN presents the best papers from SELSE 2018, which was held on April 3-4, 2018, in Boston, MA, USA. Detailed information about SELSE 2018 and previous SELSE workshops, including links to presentations, is available at <http://www.selse.org>. The three papers listed below were selected as the Best of SELSE papers and are presented in this special DSN session. They are also included in these DSN Workshop proceedings.

1. “Hamartia: A Fast and Accurate Error Injection Framework”, Chun-Kai Chang, Sangkug Lym and Mattan Erez, University of Texas at Austin (UT Austin).
2. “Low Cost Transient Fault Protection Using Loop Output Prediction”, Sunghyun Park, Shikai Li and Scott Mahlke, University of Michigan (U. Mich.).
3. “Parity++: Lightweight Error Correction for Last Level Caches”, Irina Alam, Clayton Schoeny, Lara Dolecek and Puneet Gupta, University of California, Los Angeles (UCLA).

