

Atomic RMI 2: Highly Parallel Pessimistic Distributed Transactional Memory



Dr Pawel T. Wojciechowski

Assistant Professor
Faculty of Computing
Poznan University of Technology
Poland

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The Hong Kong Polytechnic University

► Abstract

Distributed Transactional Memory (DTM) is an emerging approach to distributed synchronization based on the application of the transaction abstraction to distributed computation. DTM comes in several system models, but the control flow model (CF) is particularly powerful, since it allows transactions to delegate computation to remote nodes as well as access shared data. However, there are no existing CF DTM systems that perform on par with state-of-the-art systems operating in other models. Hence, we introduce a CF DTM synchronization algorithm, OptSVA-CF. It supports fine-grained pessimistic concurrency control, so it avoids aborts, and thus avoids problems with irrevocable operations. Furthermore, it uses early release and asynchrony to parallelize concurrent transactions to a high degree, while retaining strong safety properties. We implement it as Atomic RMI 2, in effect producing a CF DTM system that, as our evaluation shows, can outperform a state-of-the-art non-CF DTM system.

► About the Speaker

Pawel T. Wojciechowski received his Ph.D. degree in Computer Science from the University of Cambridge in 2000. He was a postdoctoral researcher in the School of Computer and Communication Sciences in the Distributed Systems Laboratory at Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland, from 2001 to 2005. He holds a Habilitation degree from Poznan University of Technology, Poland, where he is currently an Assistant Professor in the Institute of Computing Science. He has led many research projects and coauthored dozens of papers. His research interests span topics in concurrency, distributed computing, and programming languages.

All are welcome!

Enquiries:

Professor George Baciu

Email: csgeorge@comp.polyu.edu.hk

Tel : 2766 7295 / 2766 7272

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