



Effective Fusion and Separation of Distribution, Fault-Tolerance, and Energy-Efficiency Concerns

Young-Woo Kwon

Department of Computer Science at Virginia Tech

Abstract: As modern software applications are becoming increasingly distributed and mobile, their design and implementation are characterized by distributed software architectures, possibility of faults, and the need for energy awareness. Thus, software developers should be able to simultaneously reason about and handle the concerns of distribution, fault-tolerance, and energy efficiency. Being closely intertwined, these concerns can introduce significant complexity into the design and implementation of modern software. Thus, to develop reliable and energy efficient applications, software developers must understand how distribution, fault-tolerance, and energy efficiency interplay with each other and how to implement these concerns while keeping the complexity in check. In this talk, I will focus on these concerns and their interaction. I will report on novel approaches, techniques, and tools that effectively fuse and separate these concerns as required by particular software development scenarios.

Young-Woo Kwon is a Ph.D. candidate in the department of Computer Science at Virginia Tech, working under the direction of Dr. Eli Tilevich. Prior to coming to Virginia Tech at Fall 2008, he held software development positions at NHN Corporation and Daewoo Electronics for three years, after receiving the B.S. degree in Computer Engineering from Kyungpook National University in 2003 and the M.S. in Information and Communications from Gwangju Institute of Science and Technology (GIST) in 2005. His research interests include fault tolerant and energy efficient distributed executions. His research has had impact on the field by publishing at key peer-reviewed conferences in Distributed Systems and Software Engineering, including Middleware, ICDCS, and ICSM. He was awarded the Bronze Prize at the 18th Samsung Human-Tech Thesis Prize (2012).

Selected Publications

- [1] **Young-Woo Kwon**, Eli Tilevich, and Taweessup Apiwattanapong, "Hardening distributed components with network volatility resiliency," ACM/IFIP/USENIX 10th International **Middleware** Conference 12/2009. (Acceptance Rate: 17%)
- [2] **Young-Woo Kwon** and Eli Tilevich, "Energy-Efficient and Fault-Tolerant Distributed Mobile Execution," 32nd International Conference on Distributed Computing Systems (**ICDCS'12**), 06/2012. (Acceptance Rate: 13%)
- [3] **Young-Woo Kwon** and Eli Tilevich, "The Impact of Distributed Programming Abstractions on Application Energy Consumption" Information and Software Technology Journal, 09/2013
- [4] **Young-Woo Kwon** and Eli Tilevich, "Reducing the Energy Consumption of Mobile Applications Behind the Scenes" the 29th International Conference on Software Maintenance (**ICSM'13**), 09/2013. (Acceptance Rate: 22%)