

Research Experience

2006 - PRESENT CARNEGIE MELLON UNIVERSITY PITTSBURGH, PA

Dependency-Agnostic Online Upgrades in Distributed Systems

- Hidden dependencies (reliance on APIs, protocols, data or performance levels that cannot be detected automatically) are a major inhibiting factor for online upgrades.
- Dependency-agnostic upgrades isolate the new version of the distributed system from the old, by installing it in a parallel infrastructure, and eliminate the need for dependency tracking.
- Assessing the impact of change management on the online system and scheduling the upgrade operations to minimize disruptions and maximize overall business value.

2003 - 2006 CARNEGIE MELLON UNIVERSITY PITTSBURGH, PA

Versatile Dependability

- Implemented the first version of MEAD middleware (proactively reconfigurable, adaptive, reliable middleware).
- Conducted experimental research revealing the unpredictability of fault-tolerant middleware, even in the absence of faults, and proposed technique for achieving statistical predictability. <http://www.ece.cmu.edu/~mead>

2001 - 2003 CARNEGIE MELLON UNIVERSITY PITTSBURGH, PA

Stochastic Communication

- Conducted research and proposed a new communication paradigm for the on-chip interconnection networks, based on a randomized broadcast algorithm.

Skills

- *Distributed Systems*: Web Services, CORBA, fault-tolerant middleware, process replication, reliable group communication
- *Networking*: TCP/IP, GIOP, HTTP, QoS
- *Programming*: C, C++, Java, Perl, Lex/Bison, Matlab, Assembly, SQL
- *Foreign Languages*: French, Romanian, Italian

Selected Publications

- T. Dumitraş and P. Narasimhan. 'Why Do Upgrades Fail And What Can We Do About It? Toward Dependable, Online Upgrades in Enterprise Systems.' In *ACM/IFIP/USENIX Conference on Middleware*, Urbana-Champaign, IL, Nov–Dec 2009.
- T. Dumitraş, D. Roşu, A. Dan and P. Narasimhan, 'Ecotopia: An Ecological Framework for Change Management in Distributed Systems.' In *Architecting Dependable Systems Vol. IV*, edited by C. Gacek, A. Romanovsky and R. de Lemos, Springer-Verlag, 2007
- T. Dumitraş and P. Narasimhan. 'Fault-Tolerant Middleware and the Magical 1%'. In *ACM/IFIP/USENIX Conference on Middleware*, Grenoble, France, Dec. 2005.
- P. Narasimhan, T. Dumitraş, A. M. Paulos, S. M. Pertet, C. F. Reverte, J. G. Slember and D. Srivastava. 'MEAD: Support for Real-Time, Fault-Tolerant CORBA'. In *Concurrency and Computation: Practice and Experience*, vol. 17, no. 12, 2005, pp. 1527-1545, Wiley and Sons
- T. Dumitraş, D. Srivastava and P. Narasimhan. 'Architecting and Implementing Versatile Dependability'. In *Architecting Dependable Systems Vol. III*, edited by C. Gacek, A. Romanovsky and R. de Lemos, Springer-Verlag, 2005
- T. Dumitraş, S. Kerner and R. Mărculescu. 'Towards on-chip fault-tolerant communication'. In *Asia and South Pacific Design Automation Conf.*, Kitakyushu, Japan, Jan. 2003. **(Best Paper Award)**

Honors and Awards

- John Vlissides Award, ACM SIGPLAN, 2009
- 1st Place, ACM Student Research Competition, OOPSLA 2009
- Graduate Student Service Award, Carnegie Mellon University, 2006
- Best Paper Award, Asia and South Pacific Design Automation Conference, 2003
- French government's EIFFEL excellence scholarship, 1999–2001
- European Union's ERASMUS study abroad scholarship, 2000

Activities

- President, ECE Graduate Student Organization, Carnegie Mellon University
- President, Romanian Students Association, Carnegie Mellon University