



The Center for Autonomic Computing at Rutgers University

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On the Usefulness of Applying Application Utility

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Abstract:

Autonomic Computing systems should be able to adapt to unexpected circumstances. A major focus of our current research is how to engineer mechanisms that support that kind of self-adaptation, so that we can "design for the unexpected". In particular, the work presented in this talk adopts the idea of application-level utility, as an abstract way to gauge the "health" of a running software system. Utility can be expressed as a function of the current state of the system, without necessarily engaging in deep analysis of the causes and significance of incidents and conditions that occur at run time and change that state. In our work, an application utility function is a means to map the trajectory of the application state over time to a simple value indicating whether the software is fulfilling some intended task. We present the following contributions: how to automate the elicitation of utility data from an application, based on the instrumentation of the corresponding software; how to synthesize application-level utility functions, by means of statistical analysis of such state data; how to embed synthesized utility functions within the runtime code of the application, thus making it utility-aware. We describe this process by means of a number of examples, and discuss the principal traits of our engineering approach.

Bio:

Giuseppe (Peppo) Valetto has received his Laurea degree in Electronic Engineering in 1992 from the Politecnico di Torino - Turin, Italy, and his MS and Ph.D. degrees in Computer Science from Columbia University, New York, NY, USA, in 1994 and 2004 respectively. He has worked for about 14 years as a researcher in software engineering and distributed systems, in academia as well as industry, including a post-doc at the T.J. Watson research center in Hawthorne, NY, USA. Since 2007, he has joined Drexel University, in Philadelphia, PA, USA, as an assistant professor. Peppo's current research interests include methods and facilities for the engineering of autonomic, self-adaptive software systems, and the investigation and support of software development teams, their coordination and their governance.

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