Seminar Topics and Literature

A. Seminar Topics with Emphasis on Adaptivity

A.1 Architecture-Based Approach (presentation: 12.02)
- An Architecture Based Approach to Self-Adaptive Software, P. Oreizy et al, IEEE Intelligent Systems, 1999 (9p)

A.2 Architecture-Based Adaptation Middlewares (presentation: 19.02)
- K. Geihs etal, "A Comprehensive Solution for Application-Level Adaptation", submitted to Software:Practice & Experiences, 2007 (31p). MADAM - a comprehensive adaptation middlewrae framework that includes experiences.(Need not look at context middleware (sect 3.3) and modelling tools (sect 4))

- Pierre-Charles David and Thomas Ledoux. An Aspect-Oriented Approach for Developing Self-Adaptive Fractal Components. In Welf Löwe and Mario Südholt, editors, International Workshop on Software Composition (SC), volume 4089 of Lecture Notes in Computer Science, Vienna, Austria, pages 82-97, March 2006 (16p) (SAFRAN introduces an extension to the Fractal model which enables dynamic weaving of adaptation policies to components).

- Fractal (use as needed. focus on the model, not on Java support):Bruneton, É., Coupaye, T., Leclercq, M., Quéma, V., and Stefani, J.-B.. "The Fractal Component Model and Its Support in Java", Software Practice and Experience, special issue on Experiences with Auto-adaptive and Reconfigurable Systems. 36(11-12), 2006, p 1257-1284

Background Material
(for more detailed info, recommended if you have the time and interest)

- FScript: scripting language used in SAFRAN to program component reconfigurations. Pierre-Charles David and Thomas Ledoux. Safe Dynamic Reconfigurations of Fractal Architectures with FScript. In Proceeding of Fractal CBSE Workshop, ECOOP'06, Nantes, France, July 2006. (4p)

- Wildcat: context middleware for SAFRAN Pierre-Charles David and Thomas Ledoux. WildCAT: a generic framework for context-aware applications. In Proceeding of MPAC'05, the 3rd International Workshop on Middleware for Pervasive and Ad-Hoc Computing, Grenoble, France, November 2005. ACM Press

A.3 Reflective and Adaptive Middlewares (presentation: 11.03)
- ReMMOC: Grace, P., Blair, G.S., Samual, S., "ReMMoC: A Reflective Middleware to Support Mobile Client Interoperability", Proceedings of the International Symposium on Distributed Objects and Applications (DOA'03), Catania, Sicily, November 2003. (?p)

- OpenCOM: Coulson G., Blair G., Grace P., Joolia A., Lee K., Ueyama J. OpenCOM

- v2: A component model for building systems software. Proceedings of IASTED Software. Engineering and Applications (SEA). ESA, Cambridge, MA, November 2004 (6p)

A.4. Aspect weaving (presentation: 08.04)

- B. Lagaisse and W. Joosen. True and Transparent Distributed Composition of Aspect-Components. In Proceedings Middleware'06, volume 4290 of Lecture Notes in Computer Science, 2006. (10p)

- Introductory material on paper AOP or AOSD:
  http://en.wikipedia.org/wiki/Aspect-oriented_programming http://en.wikipedia.org/wiki/AspectJ

A.5 Other Examinable Material (on adaptivity)

- Distributed Systems – Principles and Design, A. Tanenbaum, M. Van Steen, Prentice-Hall, 2007, chap 2.2, 2.3, (7p). Overview.

- Composing Adaptive Software, P. K. McKinley et al, IEEE Computer, 2004 (9p). Introductory on self-adaptive software systems.

- Kephart J.O., Das R. Achieving Self-Management via Utility Functions. IEEE Internet Computing, 11(1):p. 40–48. IEEE Computer Society, 2007. Background material on rule-based, goal-based, and utility-based adaptation planning approaches.

D. Seminar topics with emphasis on dependability

D.1 Practical reports on dependability (presentation: 12.02)

- "Causes of Failure in Web Applications" by Soila Pertet and Priya Narasimhan

- Other relevant reports on http://www.cs.cmu.edu/~priya/downtime.html (Check if there are any on distributed systems)

- If there is none on distributed systems, then "How do Mobile Phones Fail? A Failure Data Analysis of Symbian OS Smart Phones" Marcello Cinque, Domenico Cotroneo, Università di Napoli, Napoli, Italy Zbigniew Kalbarczyck and Ravishankar Iyer, University of Illinois at Urbana-Champaign, IL, USA

  (This paper is not about distributed systems but apart from being an entertaining practical report, it describes interesting techniques for evaluating dependability.)

D.2 Dependability QoS (presentation: 26.02)

- Section 7.5.1 in TvS "Design and Evaluation of a Conit-based Continuous Consistency Model for Replicated Services." ACM Transactions on Computer Systems, by Yu and Vahdat
  (No need to read formals proofs and hard technical parts, such as Section 4.4, 4.5, and 7. Focus on policies, examples, tradeoffs, and discussions.)

Recommended
- "On the composability of consistency conditions" Information Processing Letters by Friedman, Vitenberg, and Chockler
  (Focus on the general meaning of the framework and each condition, not on the formal notation.)

D.3.1 Classical replication and group communication I (presentation: 04.03)

- Total Order Broadcast and Multicast Algorithms: Taxonomy and Survey. X. Défago, A. Schiper, and P. Urbán. *(No need to read Sections 7 and 8. The main focus is on the model, the problem, and classes of solutions in Sections 2 and 4. Sections 3 and 5 should be presented selectively.)*

  Recommended:
- Chapter 5 in the Distributed Systems collection by Sape Mullender.

D.3.2 Classical replication and group communication II (presentation: 04.03)

- Exploiting Group Communication for Replication in Partitionable Networks
  http://people.csail.mit.edu/idish/Abstracts/keidar-chapter2.html

D.4. Dependability in Web Services (presentation: 01.04)

- "Extensible Web Services Architecture for Notification in Large-Scale Systems" by Ostrowski and Birman

- "Fault Tolerance Connectors for Unreliable Web Services" Nicolas Salatge, Jean-Charles Fabre, LAAS-CNRS, Toulouse, France

D.5. Scalable membership management and failure detection (presentation: 15.04)

- "Correctness of a Gossip Based Membership Protocol" by Andre Allavena, Alan Demers and John Hopcroft(Skip the appendix. You can alsoavoid some math in Sections 4.2 and 4.3.)

- Introductory, high level overview of Scamp[7], Newscast[9], Cyclon[16].