Future of Software and Software Research

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Factors Contributing to Software Gap

- Increasing complexity of requirements
- Increasing and unmet reliability requirements
- Disparate requirements of domain-specific applications
- Inadequate measurement techniques

New/Promising Technologies - Dealing with Complexity

- Compositional software models
- High level composition languages
- Dynamically generated architectures
  - self-adapting
- Automatically generated architectures
  - formal methods
- Methods to validate architectures
  - appropriate criteria

New/Promising Technologies - Development Environments

- Collaboration techniques for globally dispersed design teams
  - "Agents" to help identify and manage software products at multiple levels
- Dynamically configurable environments
  - individualized configuration
- Monitoring techniques
  - requirements capture and tracking features
    - transformation techniques
  - constraint checking techniques

New/Promising Technologies - Domain-Specific Software

- Process models based on classes of applications
- Customized development environments
- Verification and validation methods based on classes of application
- Techniques to measure relevant attributes

Additional Thoughts

- Software gap is healthy!
- Reliability should be a top-level issue
  - Improved measurement techniques will lead to more reliable software
- Software research requires multi-discipline collaboration
- Domain-based design/development research should be funded
- Complexity management is key