Outline

• What is Software Engineering?
• What is hot?
• Who are the big players?
• What is UCSD doing?
What is Software Engineering?

• The establishment and use of sound engineering principles in order to obtain economical software that is reliable and works efficiently on real machines

Fritz Bauer
NATO Software Engineering Conference
Garmish, Germany Oct 1968
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• Management of complex relationships between entities to produce and maintain properly targeted software
What’s Hot

- Project Management
- Process Modeling
- Software Development Methods
  - Requirements Engineering
  - Software Architecture and Design
  - Software Maintenance
  - Re-Engineering
- Quality Management (incl. Testing)
- Notations and Languages (UML, Java, ...)
- Tool Support (incl. CASE, SVN, make, Ant, Maven)

Ingolf Krueger, 2009
What is Hot?

- Service oriented computing (SOC/SOA)
- Model-driven architecture/engineering (MDA/MDE)
- Cloud computing
- Cyberinfrastructures (CI)
- Ultra-large scale systems (ULSYS)
- Information Assurance (IA)
- Green Computing
- Domain specific languages (DSL)
- Web Services (WS)
- Agile Methodologies
Who are the Big Players?

- Carnegie Mellon – Software Engineering Institute
- TU München
- Vanderbilt
- Harvard
- UT Austin
- University of Innsbruck
- Purdue
- IBM, Microsoft, SAP, US Govt, et al
- UCSD (of course)
What is UCSD Doing?

• Service oriented architectures
• Model driven architecture
• Re-engineering
• Policy-reactive systems
• Process engineering

OOI – Ocean Observatories Initiative
RESCUE – Response to Crisis
CAMERA – Marine Ecology Research
PALMS – Exposure Biology

CyCORE – Comparitive Effectiveness (cancer)
Citisense – City-scale quality of life
Proteomics – Protein identification
A Quick Peek
Service Oriented Architectures and Processes

- Loose Coupling
- Late Binding
- Scalability
- Composition
- Interoperability
- Testability

- Malleability
- Manageability
- Dependability
- Incremental development

Network Implementation
Single Server, Multiple Processes
Single Application, Linked Modules
Logical Architecture (PALMS)
Questions?