

Software Design of Reliability and SW Metrics Seminar, half day course outline

Software Reliability Basic Concepts

- *Software Quality vs. Reliability*
- *Software Reliability*
- *Terminology: Software Defects, Faults and Failures*
- *Failure Rates, Failure Distributions and MTTF*
- *Understanding classic hardware system level "reliability modeling"*
- *Software Availability and Failure Rates*
- *Input Robustness*
- *Software Fault Tolerance*

Software Reliability Measurements, Metrics & Defect Analysis

Measurements and Metrics

- *Summary of the Reliability Measurements and Metrics to be tracked*
- *Defect Removal Efficiency*
- *Project Defect and Failure Tracking*
- *Failure Rate Data*
- *Defect Removal Efficiency*
- *Project Critical Defect and Failure Tracking*

Modeling – Estimation and Prediction

- *Software Reliability Modeling*
 - *Overview of Predictive Modeling*
 - *Examples of Tools and Models*
 - *Overview of Estimation Modeling*
 - *Examples of Tools and Models*

Importance of Test Strategy

- *Types of Testing*
- *Choosing right mix of testing types*

Defect Analysis

- *Defect and Failure Density Analysis*
- *Defect Root Cause Analysis Techniques*
 - *Failure Density Analysis*
 - *Failure Causal Analysis*

A "Best Practices" Approach to Developing Reliable Software

- *Software DfR Approaches*
 - *Formal Methods*
 - *H/W- "like" Based Approach*
 - *Best Practices Adoption Approach*
- *Software Development Best Practices*
 - *Comparing Development Behavior Patterns*
 - *Best Practices from "Best in Class" Companies*
 - *Weaknesses within Development Organizations*
- *The Defect Removal Strategy*
 - *Defect Phase Propagation*
 - *Integrating Reliability Practices into the Development Lifecycle*
 - *Comparing Defect Removal Practices*
- *DfR Based on a "Best Practices" Approach*
 - *The Defect Lifecycle and DfR Goals*
 - *Summary of DfR Best Practices*