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SOFTWARE QUALITY MANAGEMENT

CSP587

Prof. Dennis Hood
Computer Science



Week 1

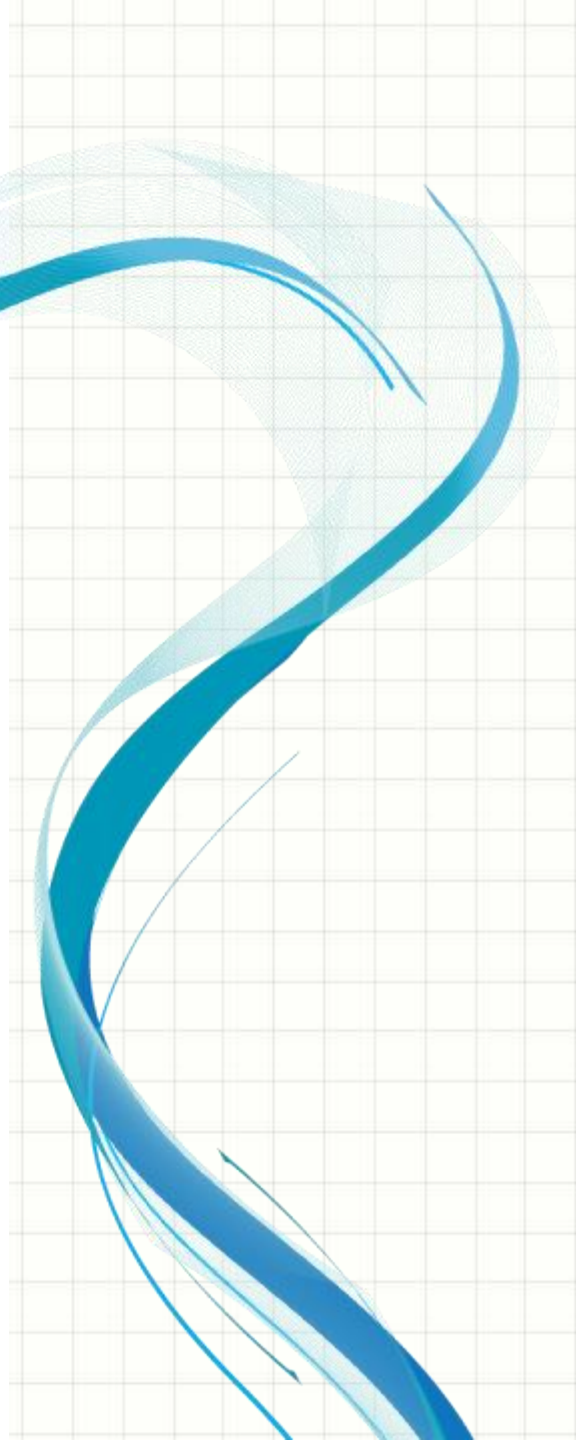
Introduction and Motivation



Instructor

Dennis Hood

- Background
 - Education
 - Teaching
 - Industry
- Contact
 - dhood@iit.edu
 - Office Hours
 - TBD - Tue/Thu 1:00pm – 1:30pm
 - SB209-B / virtual - by appointment

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Objectives

Course Objectives

- Define quality
- Understand quality's role in the software development life cycle
- Measurement
- Costs and benefits
- Planning and management
- Organization and communication
- Tool support
- Standards and certification



Reading

Readings

- Software Quality Assurance by LaPorte and April, IEEE Press / Wiley, (ISBN 978-1118501825)
- Articles, papers, etc. will be assigned to support lectures



Grading

Grading

- Individual assignments (4 @ 5% each)
- Research paper (20%)
- Team projects (20%)
- Final exam (20%)
- Engagement (20%)



Motivation

Case: CrowdStrike

- Why invest time, money, and effort into achieving greater levels of quality?
 - Ask Delta about Microsoft ... and then ask Microsoft about CrowdStrike
 - Ask Delta passengers who were stranded in airports a few weeks ago if they care about CrowdStrike (or if they even know what CrowdStrike is)

Software Quality Assurance

- What is quality?
- What makes software unique?
- How much is quality worth?
- Where do defects come from?
- How do we find and remove them?
- Development vs. maintenance

Quality Defined

- Quality
 - A degree of excellence
 - A critical yet understated requirement
- Quality Assurance
 - Proactive planning and systematic assessment
 - Enforcement of quality standards
- QA is a process for achieving quality

Quality Goals

- Prevent, discover and eliminate defects
- Deliver customer satisfaction by representing the user in design and development
- Enforce standards and process
- Mind the gate
- Improve processes
- Review, audit, monitor, verify, validate and inspect

Development Life Cycle Perspectives

- Waterfall
 - Complete each step to provable correctness before moving on to the next step
- Iterative
 - Try, learn, improve
 - Repeat until it is provable correct
- Agile
 - Embrace the dynamics of this complex, ever-changing world
 - Be flexible

The Value of Quality

- Quality increases customer satisfaction
 - Credibility lasts and attracts new business
- Lack of quality leads to rework
 - Unscheduled work means unplanned expense and slipping schedules
 - Work under duress increases the likelihood of more mistakes
- Uptime and performance are largely determined by quality
 - Lack of quality drives the need to change

The SQA Environment

- Contractual conditions
 - Scope, time, budget, etc.
- Customer-supplier relationship
 - Change management, acceptance, etc.
- Teamwork
 - Variety of skills, parallel activities, etc.
- Multiple project support
- HCI / usability concerns
- Turnover management
- Maintenance
 - Enhancement and release management, troubleshooting, etc.

Defect Classification

- Incorrect specification of requirements
- Misunderstanding of client's needs
- Deviation from requirements
 - Gold-plating, short-cutting, etc.
- Design errors
- Coding errors
- Violation of standards
- Poor test coverage
- User interface / usability errors
- Documentation errors

QA vs. QC

- Quality Assurance
 - Prevent defects
 - Improve the level of quality through an efficient set of activities performed throughout the life cycle
- Quality Control
 - Eliminate defective products
 - Improve the rate of acceptable product delivery through an efficient set of defect detection activities, primarily late in the life cycle

Management

- The org chart
- Project management
- Relationship management
- Budget management