Wrap-Up

EECS3311: Software Design
Fall 2017

CHEN-WEI WANG

What You Learned

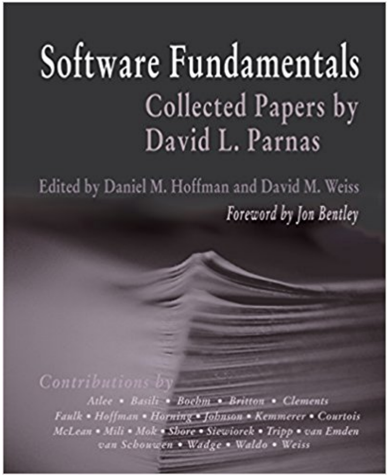
- **Design Principles**:
  - *Abstraction* [contracts, architecture, math models]
    Think ***above the code level***
  - Information Hiding
  - Single Choice Principle
  - Open-Closed Principle
  - Uniform Access Principle
- **Design Patterns**:
  - Singleton
  - Iterator
  - State
  - Composite
  - Visitor
  - Observer
  - Event-Driven Design
  - Undo/Redo, Command [lab 4]
  - Model-View-Controller [project]

Beyond this course. . . (1)

- How do I program in a language not supporting *DbC* natively?
  - Document your *contracts* (e.g., JavaDoc)
  - But, it's critical to ensure (manually) that contracts are ***in sync*** with your latest implementations.
  - Incorporate contracts into your Unit and Regression *tests*
- How do I program in a language without a *math library* ?
  - Again, before diving into coding, always start by *thinking above the code level* .
  - Plan ahead how you intend for your system to behaviour at runtime, in terms of interactions among *mathematical objects* .

    A ***mathematical relation***, a formal model of the ***graph data structure***, suffices to cover all the common problems.
  - Use efficient data structures to support the math operations.
  - Document your code with *contracts* specified in terms of the math models.
  - Test!

Beyond this course... (2)


Software Fundamentals

Collected Papers by
David L. Parnas

Edited by Daniel M. Hoffman and David M. Weiss

Foreword by Jon Bentley

Contributions by

Atlee • Basili • Boehm • Britton • Clements
Faulk • Hoffman • Horning • Johnson • Kemmerer • Courtois
McLean • Mili • Mok • Shore • Siewiorek • Tripp • van Emden
van Schouwen • Wadge • Waldo • Weiss

- *Software fundamentals: collected papers by David L. Parnas*
- Design Techniques:
  - Tabular Expressions
  - Information Hiding