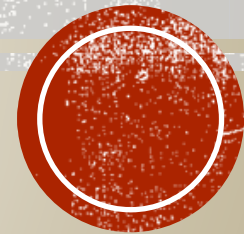


**CS 428**

**WEBSTER #3**

Fall 2021

Bruce F. Webster



- Same problem as project estimation, but for a project already underway
  - Most organizations are very bad at predicting when a given project will ship
  - Usually rely on 'metrics' that aren't at all useful
- A meaningful, useful project metric has three key qualities:
  - Informative/predictive: tells you something important and/or when you will deliver
  - Objective: should yield the same value regardless of who is doing the measuring
  - Automated: can be done quickly and without direct human intervention
- Almost all major metrics used in IT projects lack one, two, or all three qualities

## LIES, DAMNED LIES, AND PROJECT METRICS [PART I, PART II, PART III] (BASELINE, 2008)

- **Weinberg's Law of Metrics:** "That which gets measured, gets fudged."
  - We will distort work and reporting to achieve required or valued metrics
- **The Metric Law of 90s:** "The first 90 percent of a development project takes 90 percent of the schedule. The remaining 10 percent of the project takes the other 90 percent of the schedule."
  - We tend to focus on low-hanging fruit in order to make metrics look good
- **The Metric Law of Least Resistance:** "The more human effort required to calculate a metric, the less often (and less accurately) it will be calculated, until it is abandoned or ignored altogether."
  - Hence the need for automation (cf. classic joke about drunk looking for keys)
- Must-read book: *Measuring and Managing Performance in Organizations* by Robert D. Austin (Dorset House, 1996)

## WEB #3 (CONT.): METRIC "LAWS"



# WEB #3 (CONT.): VISUAL ASSESSMENT IN REAL LIFE



## ■ Why is project completion so hard to predict?

- The amount of analysis (gathering relevant subject-matter information) that still has to occur
- The amount of invention (novel problem solving) that still has to occur (cf Armour, as usual)
- The amount of discovery (e.g., running into roadblocks and dead ends) that still has to occur (again, Armour)
- The adequacy of the current architecture, design and implementation
- The amount of actual coding that still has to occur
- The amount of quality engineering (testing, reviews, etc.) that still has to occur
- Unexpected turnover among engineering personnel
- Changes in market requirements and/or opportunities
- Changes in external systems upon which you depend

# WEB #3 (CONT.): THE CHALLENGE

- **First, instrumentation: automated collection of wide range of metrics/characteristics over time**
  - Result: time-stamped history for each metric/characteristic
  - These should be automated and objective
  - Can be tied to configuration management system and run on a regular basis
- **Second, heuristics: use data collected**
  - After project is done and with known timeline, use Bayesian analysis to see which combination of metrics best anticipate milestone completion
  - Use human analysis as well to look for correlations between metrics and actual progress (or lack thereof)
  - Refine set of metrics/characteristics for next project and see how well they predict progress

## **WEB #3 (CONT.): POTENTIAL APPROACH TO USEFUL METRICS**