What We Know We Don't Know

Empirical Software Engineering

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www.hillelwayne.com/talks/what-we-know-we-dont-know

“Effects of Clean Code on Understandability”

Types of Research

"Fixing Faults in C and Java Source Code: Abbreviated vs. Full-Word Identifier Names"

```
employer_number
```

`employer_number`

`emp_num`

Quantitative

Hard numbers and comparisons

Qualitative

Experiences, thoughts, actions

"On the diffuseness and the impact on maintainability of code smells: a large scale empirical investigation"

"A Large Scale Study of Programming Languages and Code Quality in Github"

Add new infix operator

Add new infix operator

What Works

Finding Defects

“Beyond Lines of Code: Do We Need More Complexity Metrics?”

“The Influence of Organizational Structure On Software Quality”

“Simple Testing Can Prevent Most Critical Failures”

Preventing Defects

“Realizing quality improvement through test driven development”

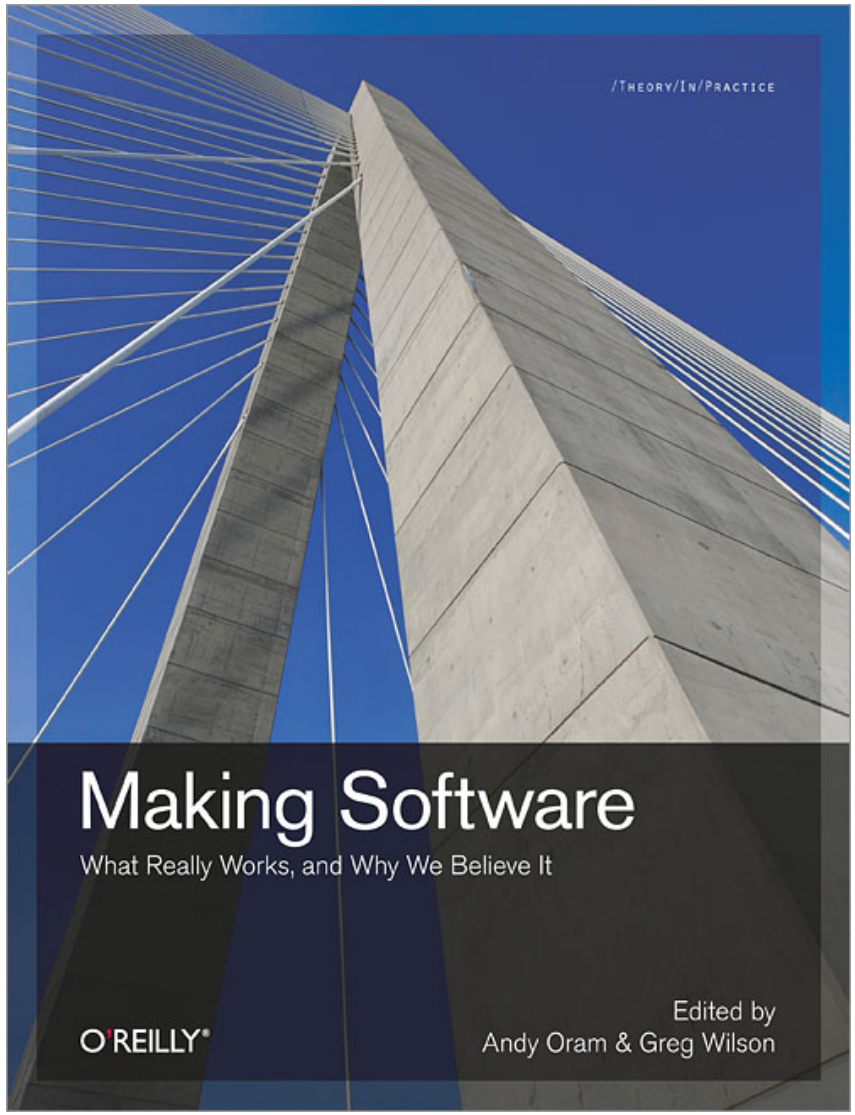
"Impact of a Night of Sleep Deprivation on Novice Developers Performance"

"Sleep deprivation: Impact on cognitive performance"

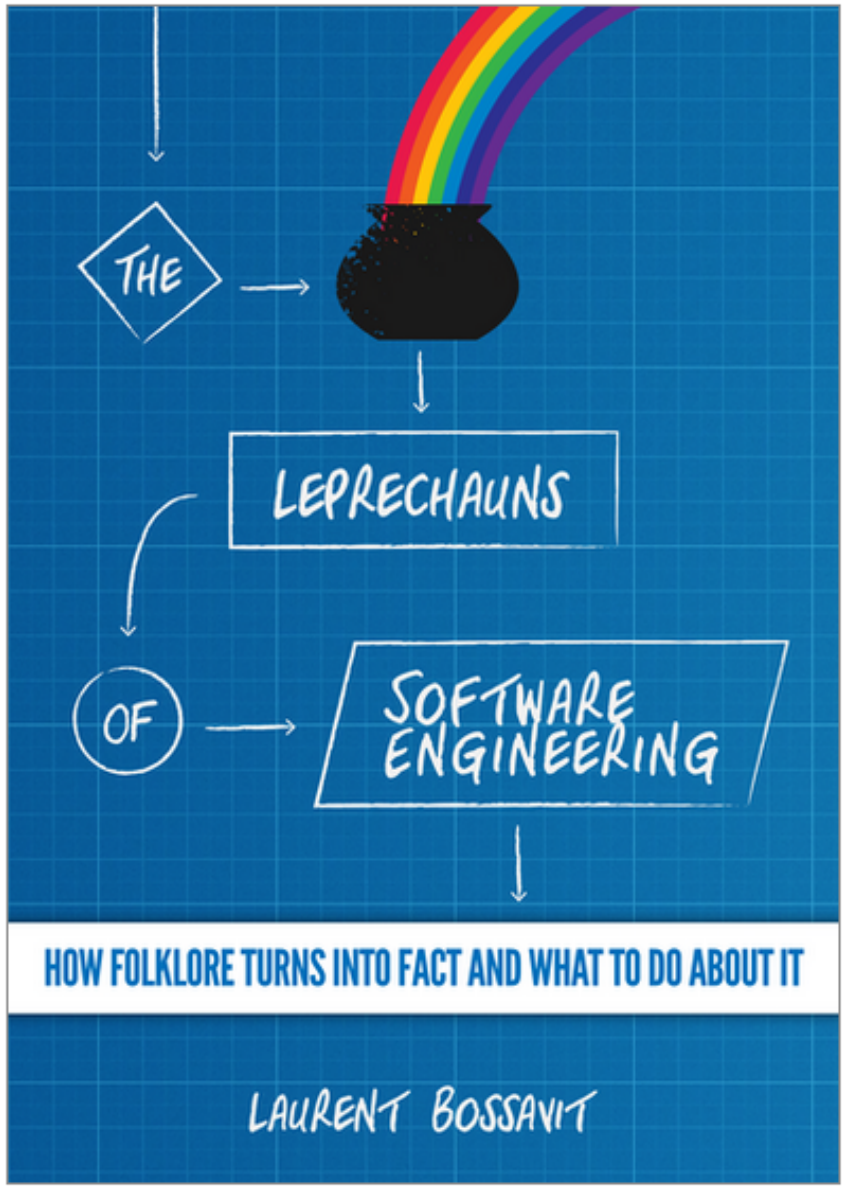
“Crunch Makes Games Worse”

Learning More

Making Software



Leprechauns of Software Engineering



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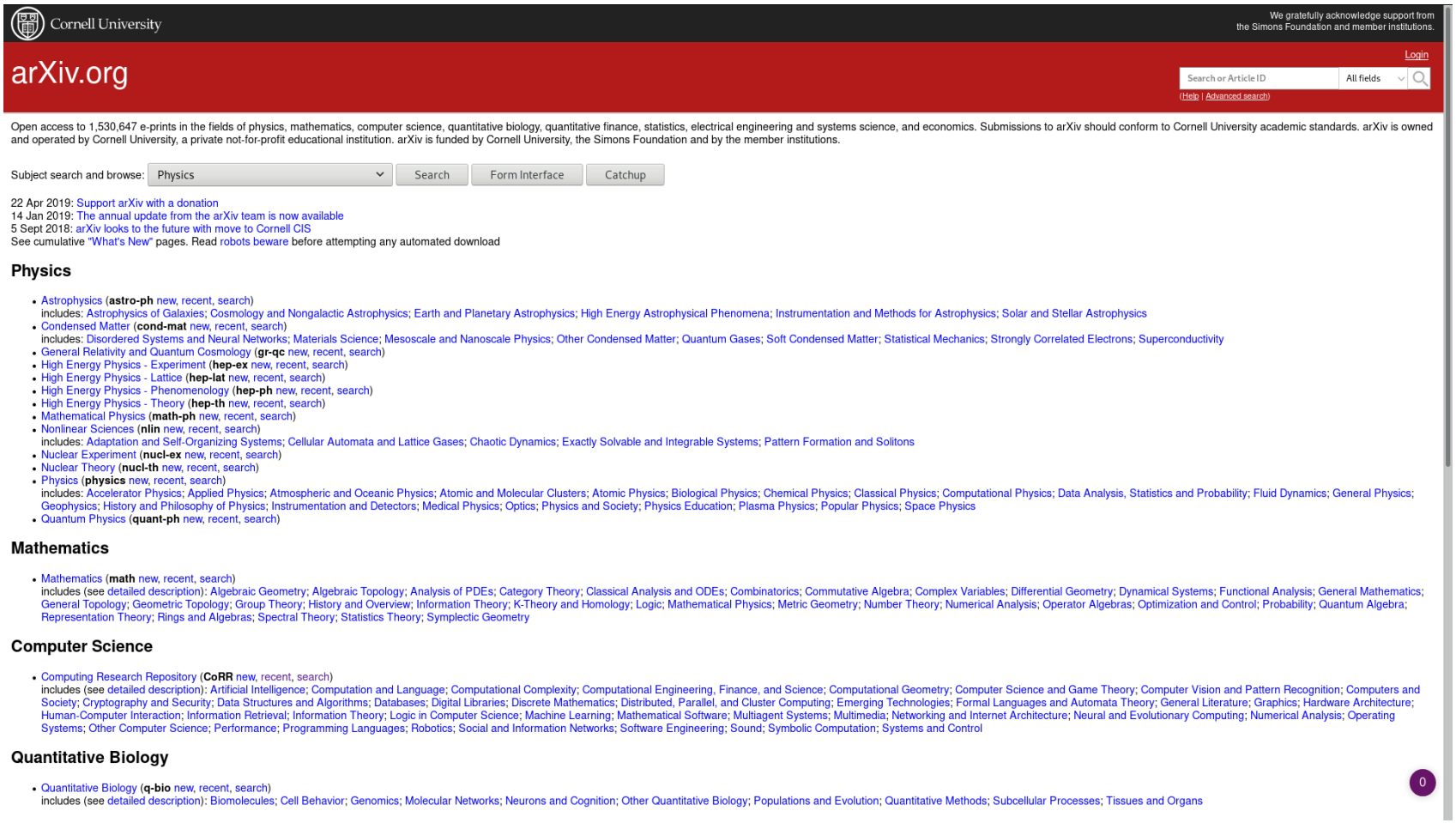

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  includes: Disordered Systems and Neural Networks; Materials Science; Mesoscale and Nanoscale Physics; Other Condensed Matter; Quantum Gases; Soft Condensed Matter; Statistical Mechanics; Strongly Correlated Electrons; Superconductivity
- General Relativity and Quantum Cosmology (**gr-qc** new, recent, search)
- High Energy Physics - Experiment (**hep-ex** new, recent, search)
- High Energy Physics - Lattice (**hep-lat** new, recent, search)
- High Energy Physics - Phenomenology (**hep-ph** new, recent, search)
- High Energy Physics - Theory (**hep-th** new, recent, search)
- Mathematical Physics (**math-ph** new, recent, search)
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- Nuclear Experiment (**nucl-ex** new, recent, search)
- Nuclear Theory (**nucl-th** new, recent, search)
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  includes: Accelerator Physics; Applied Physics; Atmospheric and Oceanic Physics; Atomic and Molecular Clusters; Atomic Physics; Biological Physics; Chemical Physics; Classical Physics; Computational Physics; Data Analysis, Statistics and Probability; Fluid Dynamics; General Physics; Geophysics; History and Philosophy of Physics; Instrumentation and Detectors; Medical Physics; Optics; Physics and Society; Physics Education; Plasma Physics; Popular Physics; Space Physics
- Quantum Physics (**quant-ph** new, recent, search)

Mathematics

- Mathematics (**math** new, recent, search)
  includes (see detailed description): Algebraic Geometry; Algebraic Topology; Analysis of PDEs; Category Theory; Classical Analysis and ODEs; Combinatorics; Commutative Algebra; Complex Variables; Differential Geometry; Dynamical Systems; Functional Analysis; General Mathematics; General Topology; Geometric Topology; Group Theory; History and Overview; Information Theory; K-Theory and Homology; Logic; Mathematical Physics; Metric Geometry; Number Theory; Numerical Analysis; Operator Algebras; Optimization and Control; Probability; Quantum Algebra; Representation Theory; Rings and Algebras; Spectral Theory; Statistics Theory; Symplectic Geometry

Computer Science

- Computing Research Repository (**CoRR** new, recent, search)
  includes (see detailed description): Artificial Intelligence; Computation and Language; Computational Complexity; Computational Engineering, Finance, and Science; Computational Geometry; Computer Science and Game Theory; Computer Vision and Pattern Recognition; Computers and Society; Cryptography and Security; Data Structures and Algorithms; Databases; Digital Libraries; Discrete Mathematics; Distributed, Parallel, and Cluster Computing; Emerging Technologies; Formal Languages and Automata Theory; General Literature; Graphics; Hardware Architecture; Human-Computer Interaction; Information Retrieval; Information Theory; Logic in Computer Science; Machine Learning; Mathematical Software; Multiagent Systems; Multimedia; Networking and Internet Architecture; Neural and Evolutionary Computing; Numerical Analysis; Operating Systems; Other Computer Science; Performance; Programming Languages; Robotics; Social and Information Networks; Software Engineering; Sound; Symbolic Computation; Systems and Control

Quantitative Biology

- Quantitative Biology (**q-bio** new, recent, search)
  includes (see detailed description): Biomolecules; Cell Behavior; Genomics; Molecular Networks; Neurons and Cognition; Other Quantitative Biology; Populations and Evolution; Quantitative Methods; Subcellular Processes; Tissues and Organs

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