

Artificial Intelligence, Blockchain, and Cryptocurrencies in Software Development

Giancarlo Succi

Dipartimento di Informatica – Scienza e Ingegneria
Università di Bologna
g.succi@unibo.it



Course Objectives

Artificial Intelligence, Blockchain, and Cryptocurrencies in Software Development

- Analyze cognitive processes in software production
- Evaluate AI tools in software engineering
- Connect engineering principles with systemic analysis
- Construct structured models of complex software systems



The Nature of Software

- Intellectual product protected by copyright
- Near-zero marginal reproduction cost
- Network-based economic dynamics
- Tame vs. wicked problems
- Engineering under uncertainty



Cognitive Models in Software Development

- Software as structured reasoning process
- Working memory and cognitive load
- Dual-process reasoning
- Systemic thinking
- Extended mind and distributed cognition



(Artificial) Intelligence in Software Engineering

- Modeling aspects of human reasoning
- Machine learning and data-driven methods
- Automated reasoning and formal systems
- AI tools in development processes
- Epistemic and methodological limits



Software as Representation

- Writing as structuring of actions
- Drawing as cognitive organization
- Modularity and separation of concerns
- Narrative structures in system design
- Precision and abstraction



Change in Software Development

- Change as intrinsic property of software
- Corrective, adaptive, perfective, preventive maintenance
- Process models and risk management
- Cognitive and organizational aspects of change