Collaboration in Software Engineering

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Who Needs Software Engineering? Everyone

- Historically, programmers...
- Now – anyone dealing with “reason” and “structure”
- What is a program? A plan of action described precisely
- This kind of thinking is not limited to programmers
  - Excel users want to think about the data in their spreadsheets
  - Network engineers configure complex, dynamic networks
  - Biologists want to understand and manipulate cell behavior
  - Etc.
Software development is rapidly changing

• Programs are now distributed systems (client + service)
• Every developer is now dev/ops
• Programs = Algorithms + Data Structures  
  Programs = Algorithms + Data Structures + **Data**  
  Wrong
• Data is the lifeblood of modern programming
  • Our industry is transforming around getting data, manipulating data, understanding data, and making important business decisions based on it
• Big data / machine learning are essential components of modern software

Microsoft Research

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Collaboration and SEIF

• SEIF historically has been focused on expanding the boundaries of software engineering

• Changes in technology drive SE innovation
  • SEIF focus areas: Cloud, Internet of Things, Mobility, NUI

• The rich interaction between academia and industry drives deep research with high impact

• We have numerous examples of this interaction based on shared infrastructure such as Z3, TouchDevelop, Kinect, etc.
Impact through Collaboration and Sharing

• Highest impact work recognizes trends early and responds quickly
  • Industry has strong financial incentives to understand trends
  • Academics often look over the horizon,
• Increasingly, impact requires infrastructure
  • Lots of data, machines, customers
• Partnerships between industry and academia benefit both

In the face of disruptive change, the future belongs to companies and academics who embrace cooperation