Hackathons for Science, How and Why?

Ei Pa Pa Pe-Than[1], Ivelina Momcheva[2], Erik Tollerud[2], and James D. Herbsleb[1]
[1]Institute for Software Research, Carnegie Mellon University, Pittsburgh, PA, USA.
[2]Space Telescope Science Institute (STScI), Baltimore, MD, USA.

Introduction

- An empirical study of 14 hackathons
  - A large-scale corporate hackathon by Microsoft
  - Events hosted by universities
  - Events hosted by scientific communities including three hack days at Space Telescope Science Institute (STScI) in Baltimore, Maryland
- Present key activities involved in the organization of hackathons for science to achieve specific goals

Why Hackathons?

- Foster innovation
- Facilitate collaborative learning, knowledge exchange, and skills development
- Expand personal networks
- Get the needed work done
- Make quick progress on technical work
- Provide fun while doing something that people are passionate about

Key Hackathon Organizational Activities

Collaboration vs Competition
- Most events play down the competition aspect

Attract attendees with relevant skillsets
- Identify people who are enthusiastic about hackathons
- Distribute promotional materials timely and effectively
- Use various invitation approaches including incentives and targeted invitations
- Organize mentoring, tutorial, and brainstorming sessions to encourage diversity and inclusion

Project Selection
- Work closely with participants to identify suitable projects
- Projects can either be completed during the hackathon (timeboxed) or serve as the basis for future collaboration (long-term)

Team formation
- Elicit participant's skills, expertise, and project preference through a questionnaire
- Match skills to projects to ensure that each team has both the needed software engineering expertise and domain science expertise

Pre-work before or at the event
- Encourage teams to have pre-meetings where they assign a team lead, divide the projects into manageable individual tasks, assign tasks and roles, and pretest technologies
- When no pre-meetings, ideation and brainstorming sessions at the event are needed

Post-work
- Follow up team progress or measure specified outcomes at the end of the event and at a specified time after the event

Conclusion

- **Advance technical work more effectively** by creating
  - Focused interruption-free work environment
  - Skill assessment among team members
  - Opportunity to leverage the knowledge of other collocated participants
- **Add hacking as a new element in the team "toolbox"**
- **Provide a fruitful avenue of collaboration** between software engineering and domain science experts

Future work: What are the other changes that hackathons could introduce in the way that people work in the context of scientific software production?

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Ei Pa Pa Pe-Than
Post-Doctoral Associate
Institute for Software Research
School of Computer Science, Carnegie Mellon University
eipa [at] cmu [dot] edu; https://eipapa.github.io; @eipa01