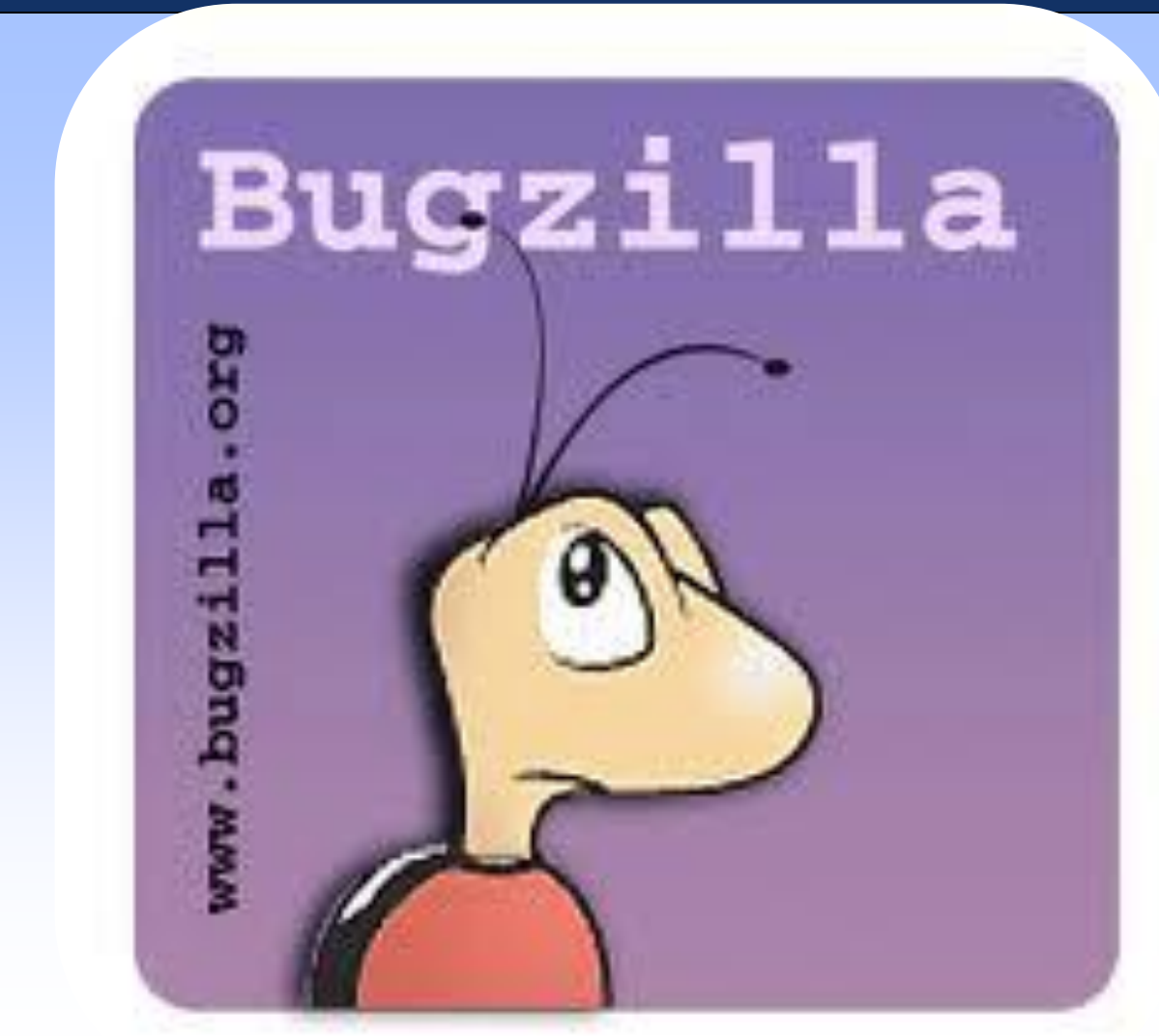


Using SNA for Mining Collaboration Data in a Bug Tracking System for Risk and Vulnerability Analysis

Atul Goyal (atul08015@iitd.ac.in)

Joint work with Dr. Ashish and Ayushi

(This work was accepted in ISEC 2011, held in Feb '11)



Introduction

Teamwork, shared tasks, interaction, collaboration b/w team members is integral to SE/SD

For a manager or a team leader, an understanding of the following aspects are important:

- Team structure and topology
- Critical employees
- Core team
- Degree of centralization or de-centralization
- Sub-groups
- Leaders and communication bridges
- People with exclusive knowledge or skills

Motivating Application [Risk and Vulnerability]

- Employee attrition/turnover (common and inevitable)
- Unavailability of an expert (unforeseen circumstance)
- De-risk: critical employees, leaders, exclusive knowledge/skills
- Assessing/Identifying risk, intelligent and proactive decision making
- Can reduce loss and save time, important for project success

Methodology



Needs/problems
[RISK ANALYSIS]

- Team structure and topology, Sub-groups
- Critical employees, Core team
- Degree of centralization or de-centralization
- Leaders and communication bridges
- People with exclusive knowledge or skills

Mozilla BUGID 250000

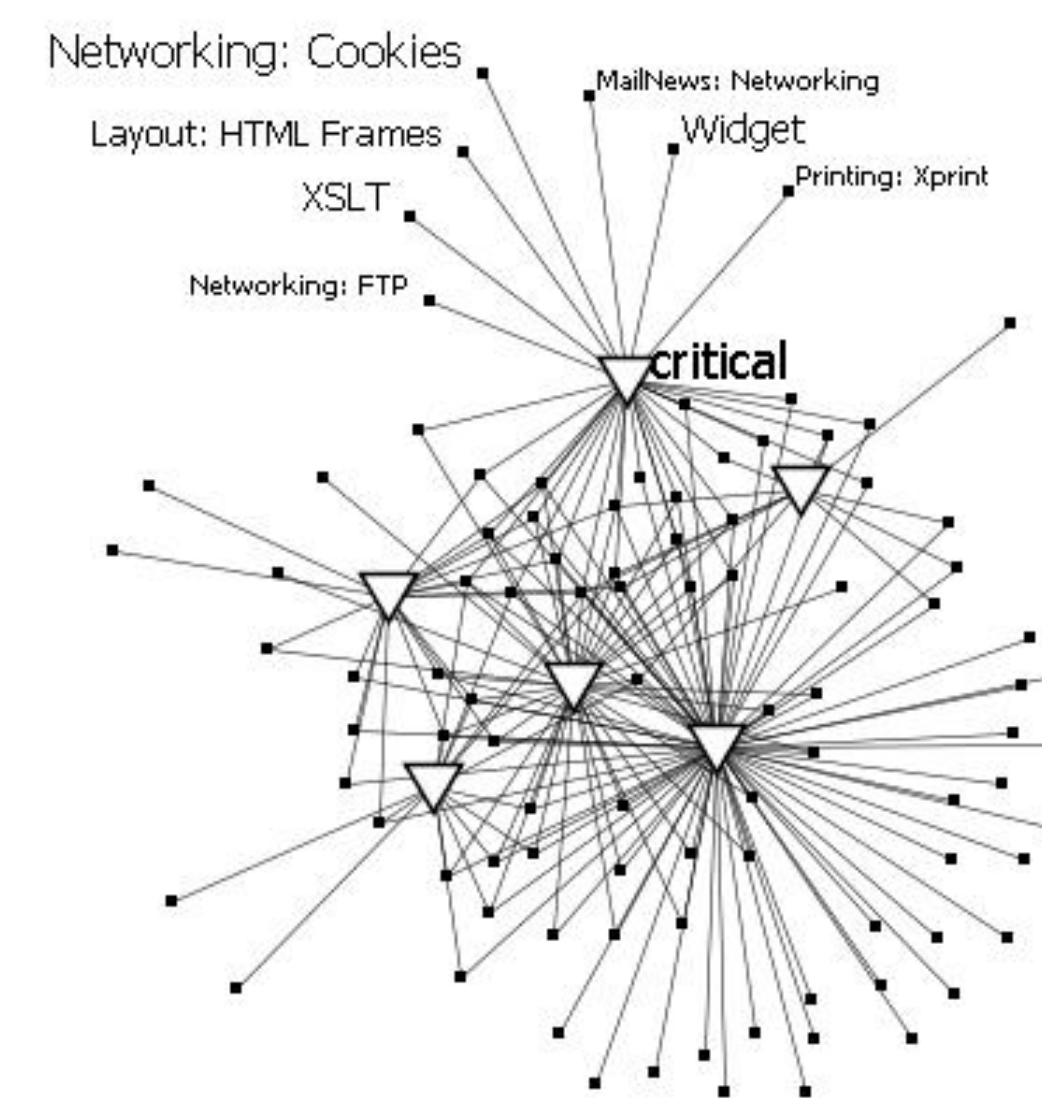
Collaboration Network

Online discussion around a bug

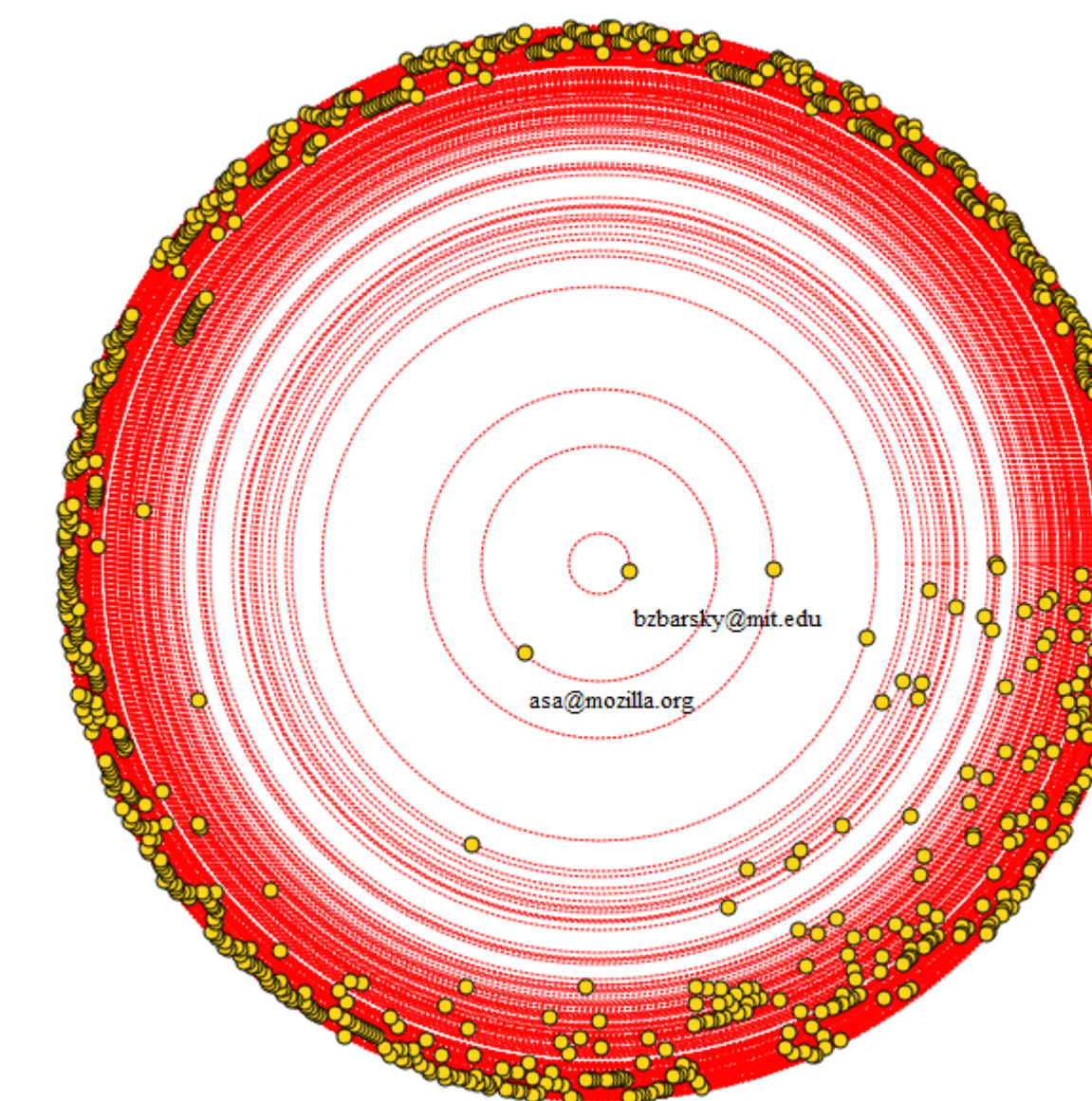
Discussion

- Understanding the interaction between developers and between developers and software product can reveal useful insights pertaining to risk, threat and vulnerability analysis in an organization.
- Static record keeping databases such as a bug tracking system provides opportunity to derive hidden and interesting patterns useful to a project manager and developers
- We throw light on aspects like core periphery patterns, cohesive subgroups and clusters, centrality, patterns present in various two mode networks such as developer to component, developer to severity and component to severity.
- We also present a systematic survey of the previous work in the area of social network analysis for mining software repositories (in the paper)

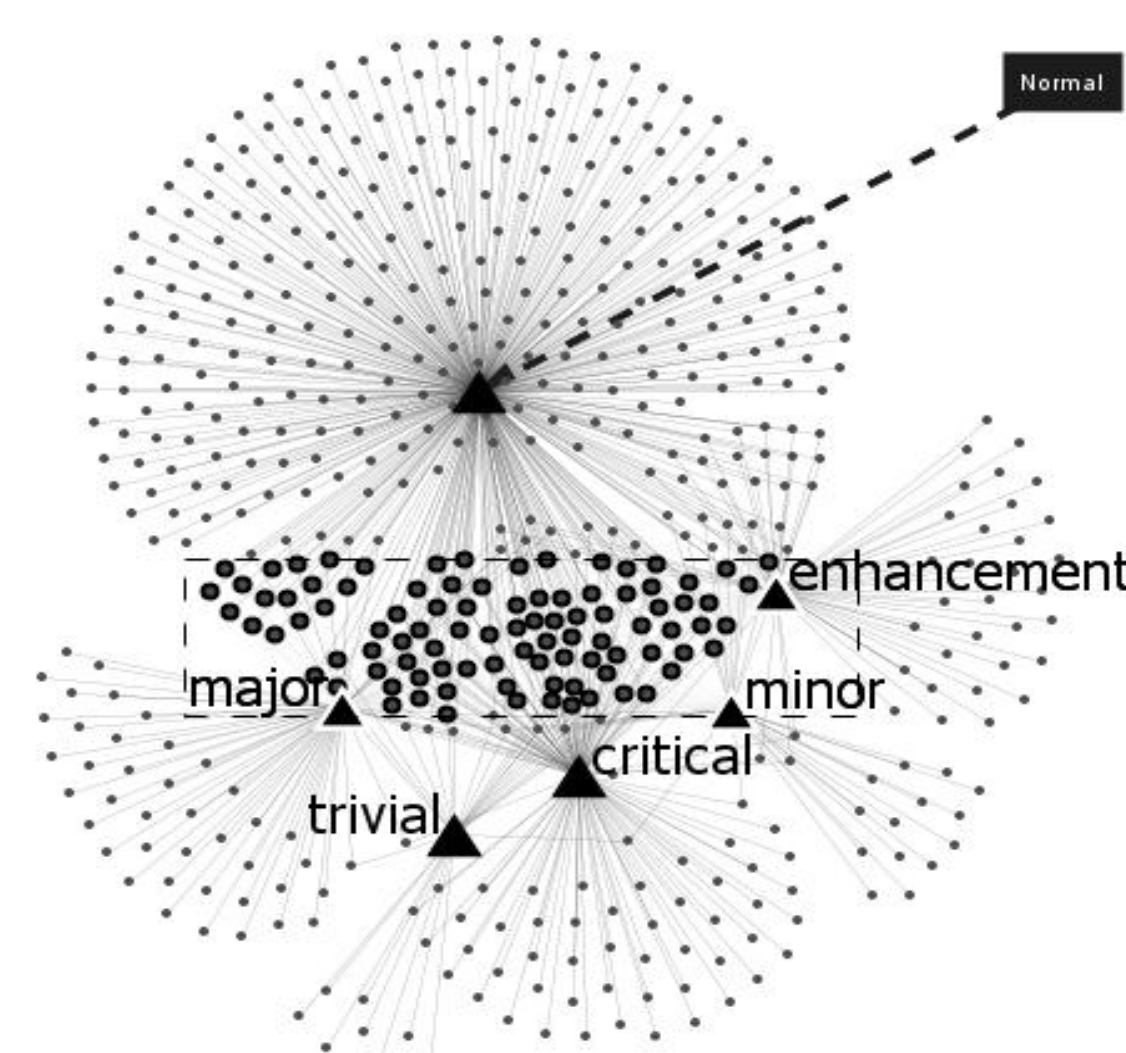
Results



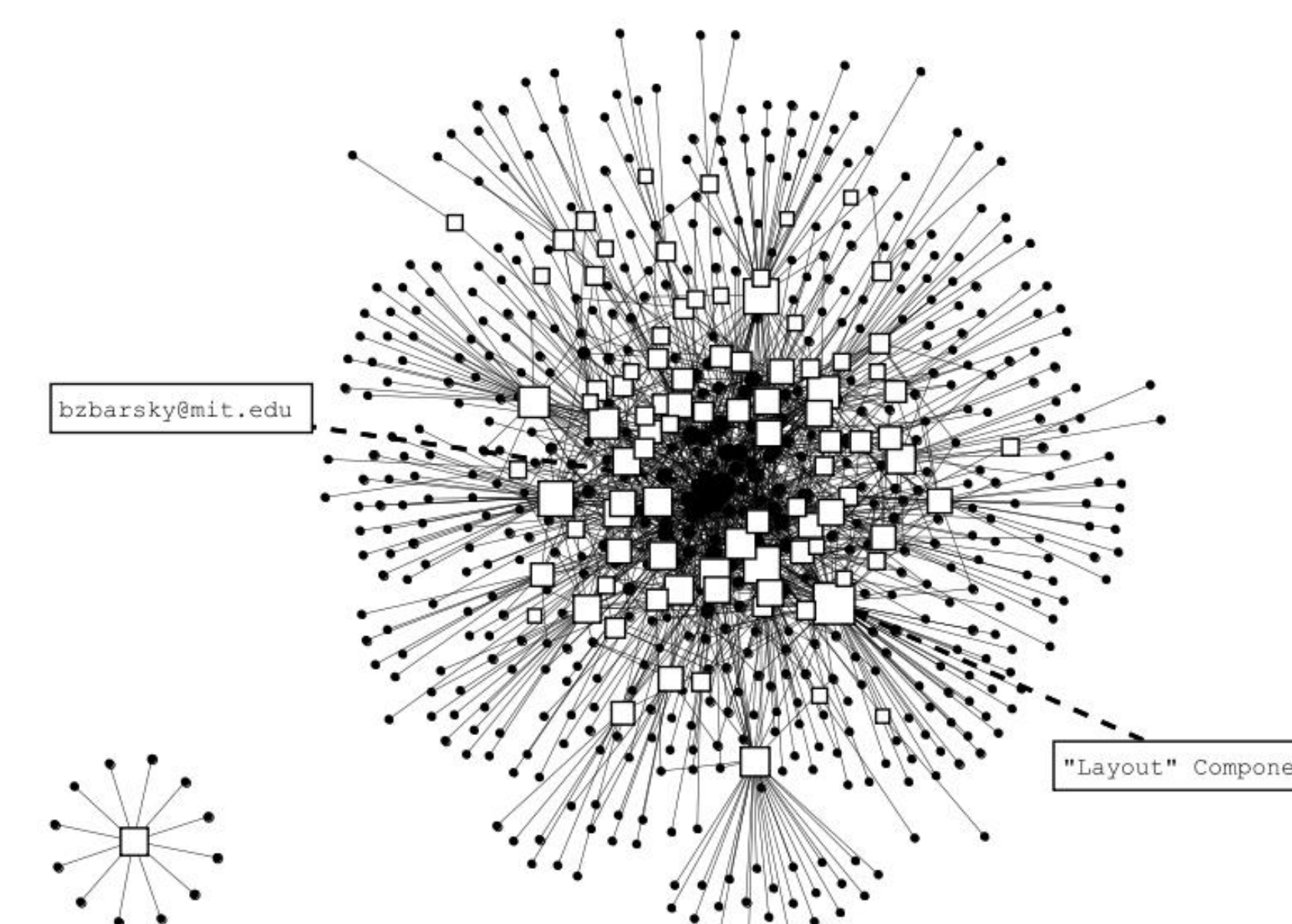
Component Severity Graph
Identification of fault-prone components



A circular layout depicting core-periphery pattern (Bug IDs: 200000 to 200990 during year 2003)



Network depicting relationship between bug severity and developers



Developer-Component relationship
Identification of developers that have knowledge of varied components

- For more information, please contact the poster presenter or any of the other authors.