

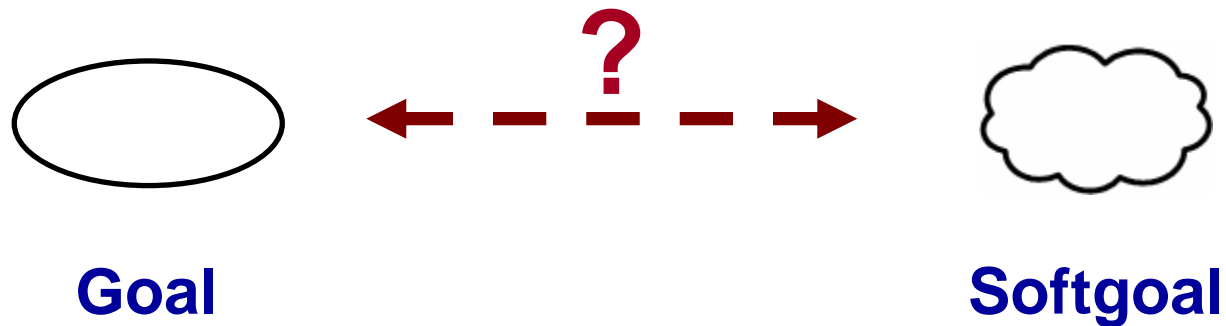
# *Reconstructing Problem Structures from Software Repositories through (Social) Network Analysis*

*The Eclipse Bugzilla Case*

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# Motivation

Identify Structures of Goals and Softgoals [Chu00]  
in Software Repositories



*API - IResource.setLocal  
has problems*

*Usability issue with external  
editors*

# Eclipse Bugzilla

## Bug Tracking System

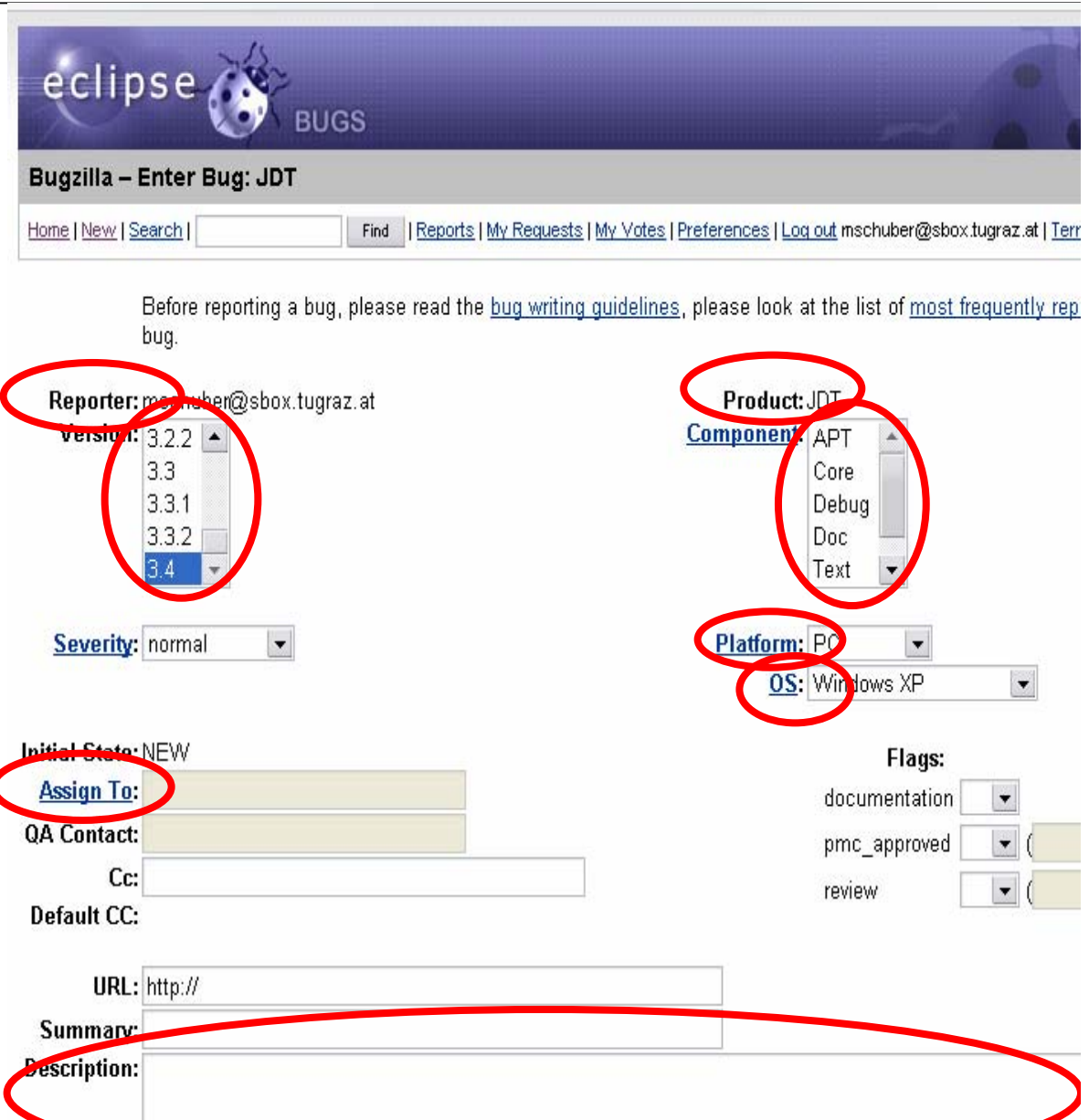
### Dataset

Created for the MSR challenge (co-located with ICSE)

Retrieved in Oct. 2006

13.517 Developer

207.743 Bugs



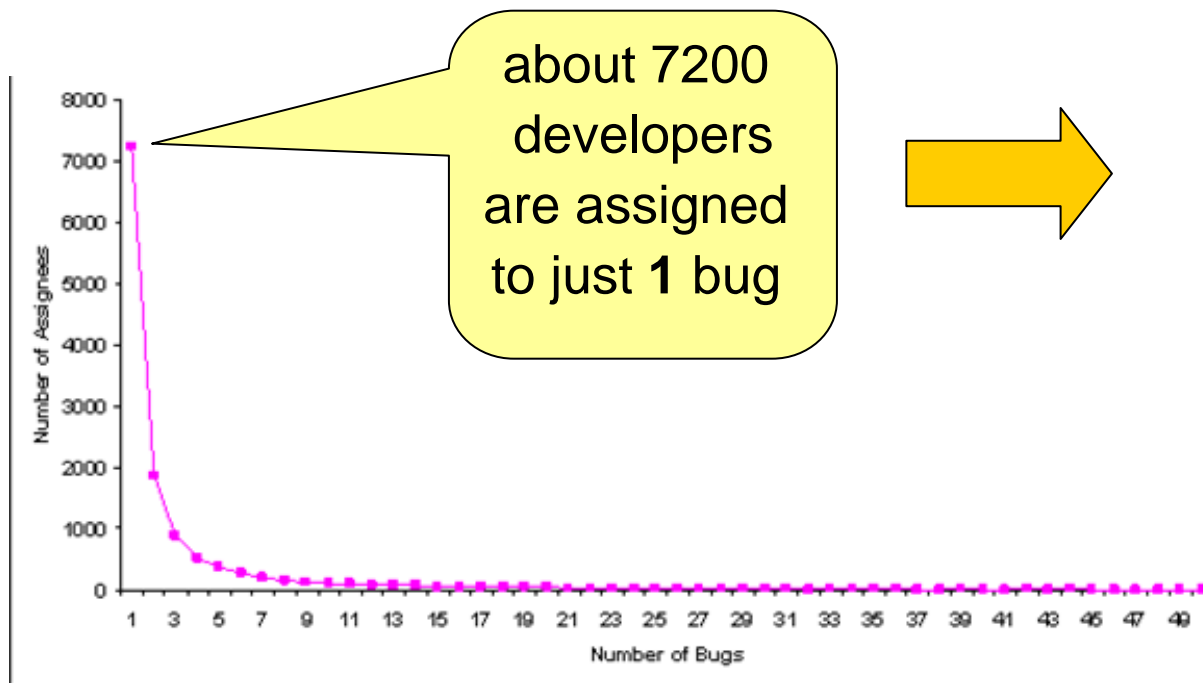
# Research Resources

## **Mining Software Repositories (MSR)**

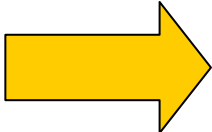
- Bug Prediction [Jos07]
  - Occurance of future bugs
- Forecasting the number of changes [Her07]
  - Time series analysis
- Prediction Bug Lifecycles [Pan07]
- Fixing time of a Bug [Wei07]
- Author–Topic Modelling [Lin07]

# Observations - Statistics

Question: What is the average number of bugs a developer is assigned to?



about 7200 developers are assigned to just 1 bug



7200 (about 50%) developers are not considered for bug relations

# Observation - Graphs

Created by a folded bipartite graph of developers and bugs

With  $k=8$

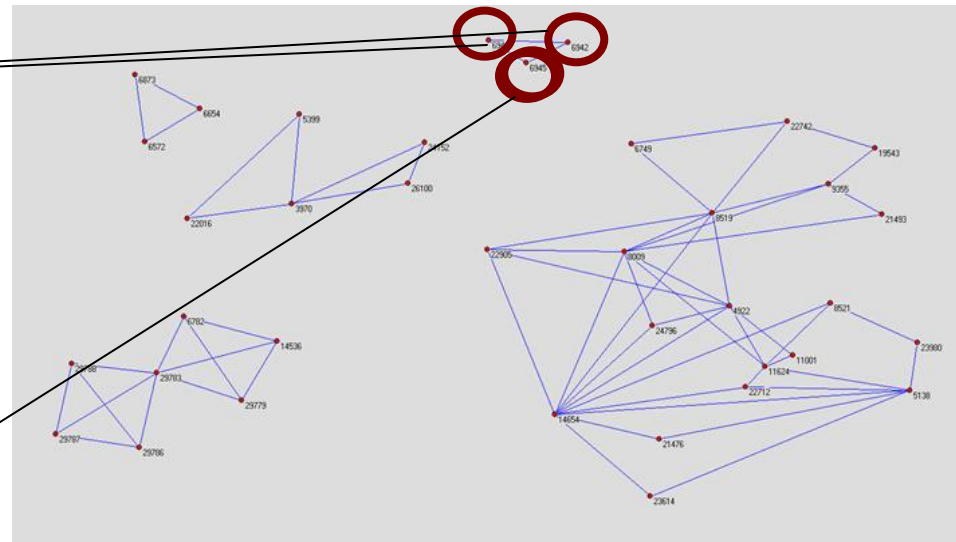
Tool: Pajek

Shells with titles (or empty string titles) do not appear in task list



Same component platform, reporter  
Similar developers, os

Child shells not displaying on WinCE



## Research Questions

Reconstruct **bug structures** from data in software repositories

Reconstruct **organisational structures** from data in software repositories

*Thanks for your attention!*

*Questions?*

Monika Schubert

# References

- [Chu00] Chung, L.; Nixon, B. A.; Yu, E. & Mylopoulos, J. (2000), **Non-Functional Requirements in Software Engineering**, Kluwer Academic Publishers, Boston/Dordrecht/London.
- [Her07] Herraiz, I.; Gonzalez-Barahona, J. M.; Robles, G. (2007), **Forecasting the number of changes in Eclipse using time series analysis**, in 'Proceedings of the 29th International Conference on Software Engineering Workshops', IEEE Computer Society.
- [Jos07] Joshi, H.; Zhang, C.; Ramaswamy, S.; Bayrak, C. (2007), **Local and Global Recency Weighting Approach to Bug Prediction**, in 'Proceedings of the Fourth International Workshop on Mining Software Repositories', IEEE Computer Society.
- [Lin07] Linstead, E.; Rigor, P.; Bajracharya, S.; Lopes, C.; Baldi, P. (2007), **Mining Eclipse Developer Contributions via Author-Topic Models**, in 'Proceedings of the Fourth International Workshop on Mining Software Repositories', IEEE Computer Society.
- [Pan07] Panjer, L. D. (2007), **Predicting Eclipse Bug Lifetimes**, in 'Proceedings of the Fourth International Workshop on Mining Software Repositories', IEEE Computer Society, , pp. 29.
- [Wei07] Weiss, C.; Premraj, R.; Zimmermann, T. & Zeller, A. (2007), **How Long will it Take to Fix This Bug?**, in Harald Gall & Michele Lanza, ed., 'Proceedings of the Fourth International Workshop on Mining Software Repositories'.