

Goal: increase software reliability Approach: specifications for formal, informal reasoning Problem: specifications are typically absent

- programmers are reluctant to write them
- programmers are not very good at writing them
- too few tools accept them as input

Solution: automatically infer program specifications Application: Erdös internet agent system from NTT



Daikon system (tool for generating specifications)

- 9 new releases at http://pag.lcs.mit.edu/daikon/
- **Theorem-proving**
 - Automate Isabelle proofs over IOA language
 - Automatically propose lemmas
 - Automatically select tactics

Temporal invariants: 3 techniques

- Results from all 3 implementations
- commercial apps, Java libraries, Erdös programs



Support tools and users; make research results broadly available

Additional experiments on NTT's Erdös agent system

- Collaboration with Tadashi Araragi of NTT
- Need additional programs

Follow up and extend previous successes

- Theorem-proving via Isabelle, ESC/Java, others
- Temporal invariants for agent and other programs