

Sculpting Software - Artificial Creativity & Improvisation in Inter-Active Development Environments

Robert Feldt

Professor of Software Engineering

Chalmers University and Blekinge Inst of Tech

robert.feldt@chalmers.se



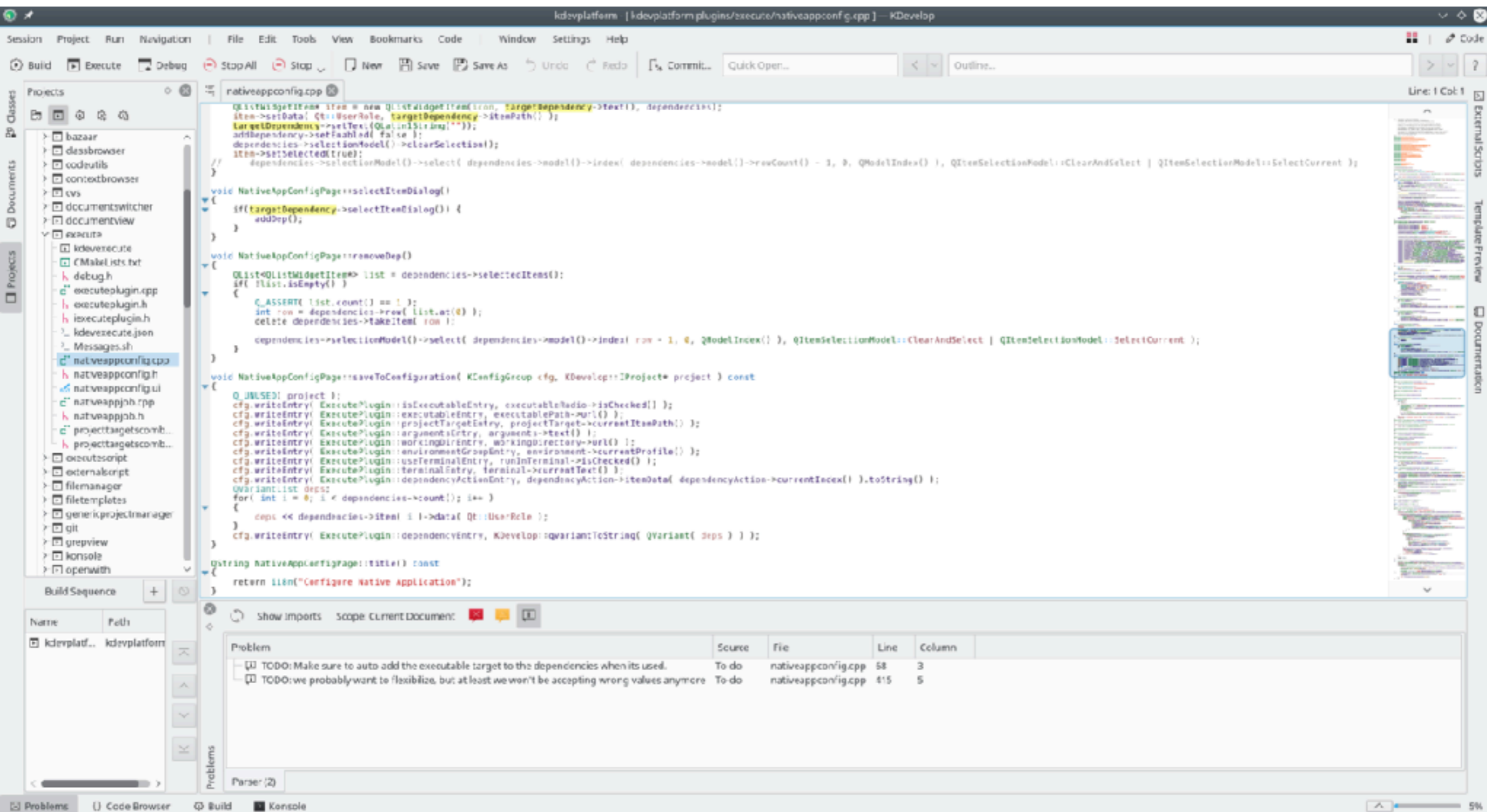
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Red Sector Inc. Megademo, 1989





IDE = Integrated Development Environment





1. Bret Victor: Direct Manipulation while Coding



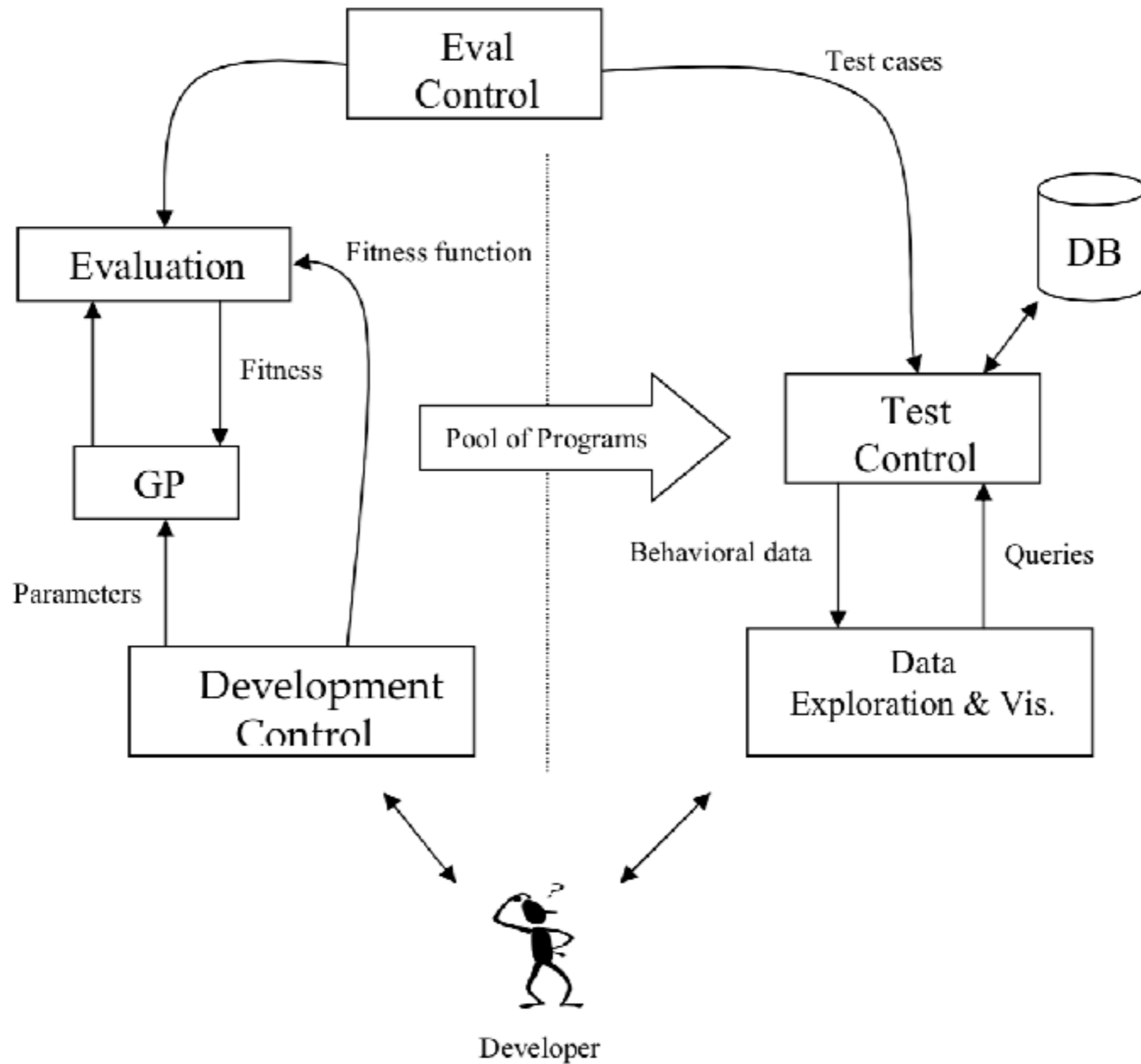
2. Artificial Creativity (& Improvisation!?)

The Surprising Creativity of Digital Evolution: A Collection of Anecdotes from the Evolutionary Computation and Artificial Life Research Communities

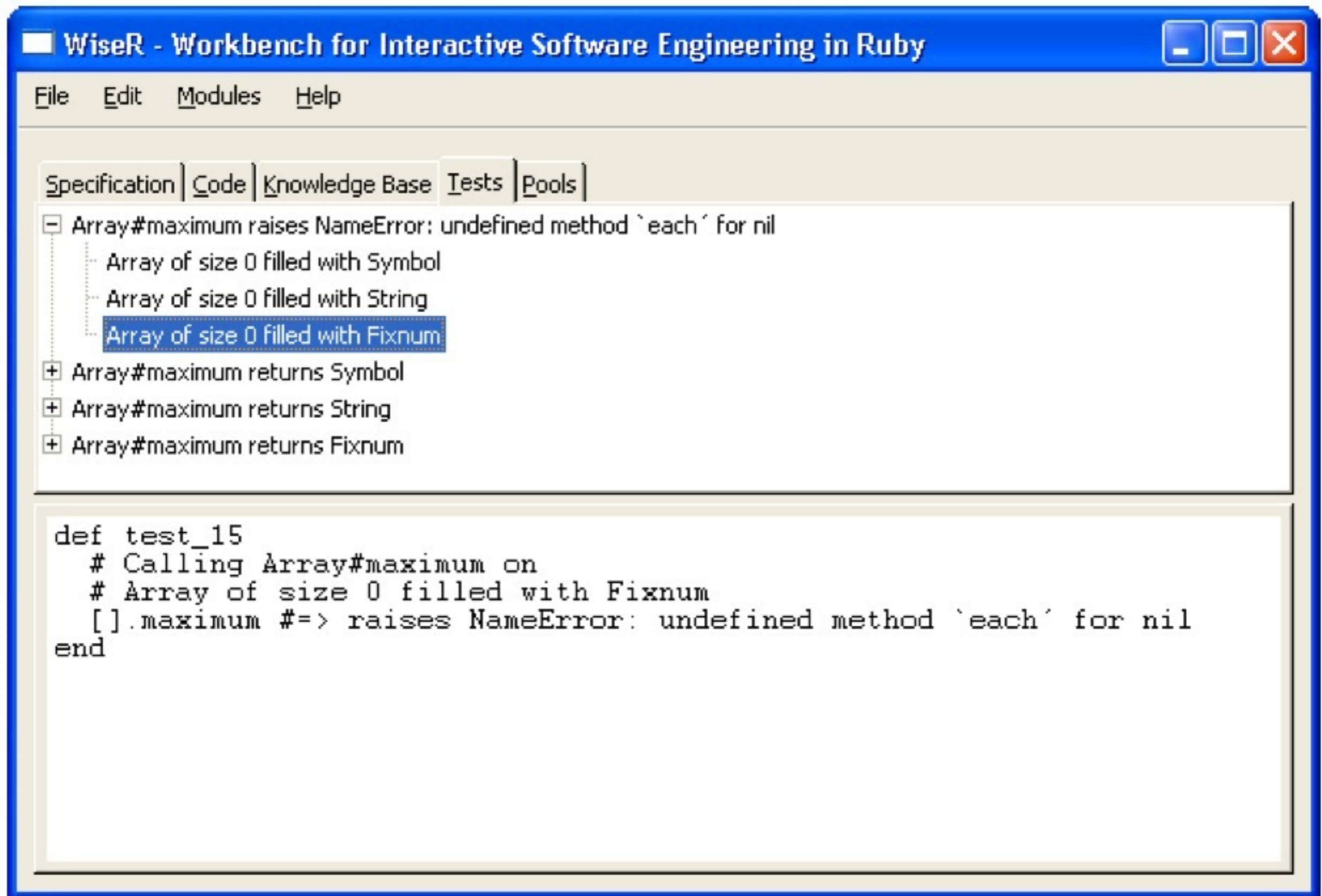
Joel Lehman^{1†}, Jeff Clune^{1, 2†}, Dusan Misevic^{3†}, Christoph Adami⁴, Julie Beaulieu⁵, Peter J Bentley⁶, Samuel Bernard⁷, Guillaume Beslon⁸, David M Bryson⁴, Frédéric Carrère⁹, Nick Cheney¹⁰, Antoine Cully¹¹, Stephane Doncieux¹², Fred C Dyer⁴, Andréas Ehinger⁹, Kai Olav Ellefsen¹³, Robert Feldt¹⁴, Stephan Fischer¹⁵, Dario Floreano¹⁶, Stephanie Forrest¹⁷, Antoine Frénoy¹⁸, Christian Gagné⁹, Leni Le Goff¹², Laura M Grabowski¹⁹, Babak Hodjat²⁰, Laurent Keller²¹, Carole Knibbe⁸, Peter Krciah²², Richard E Lenski⁴, Hod Lipson²³, Robert MacCurdy²⁴, Carlos Maestre¹², Frédéric Mansanne²⁵, Risto Miikkulainen²⁶, Sara Mitri²¹, David E Moriarty²⁷, Jean-Baptiste Mouret²⁸, Anh Nguyen², Charles Ofria⁴, Marc Parizeau⁵, David Parsons⁸, Robert T Pennock⁴, William F Punch⁴, Thomas S Ray²⁹, Marc Schoenauer³⁰, Eric Schulte¹⁷, Karl Sims, Kenneth O Stanley³¹, François Taddei³, Danesh Tarapore³², Simon Thibault⁵, Westley Weimer³³, Richard Watson³⁴, Jason Yosinski¹⁰

- 1 Uber AI Labs, San Francisco, CA, USA
- 2 University of Wyoming, Laramie, WY, USA
- 3 Center for Research and Interdisciplinarity, Paris, France
- 4 Michigan State University, East Lansing, MI, USA
- 5 Université Laval, Quebec City, Quebec, Canada

2. Artificial Creativity (& Improvisation!?)



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Flexibility

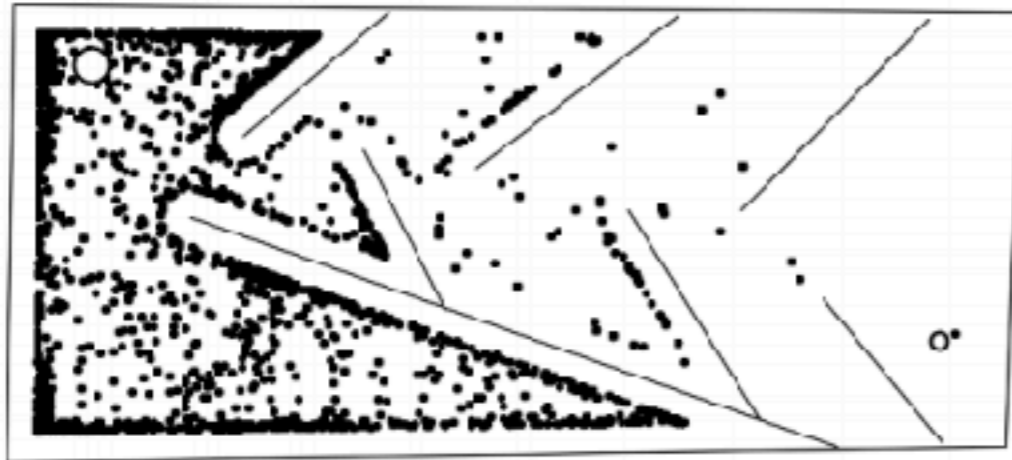


Creativity	Flexibility
Prepared	In-moment
Planned	Reactive
Slow	Fast
Cognitive	Intuitive

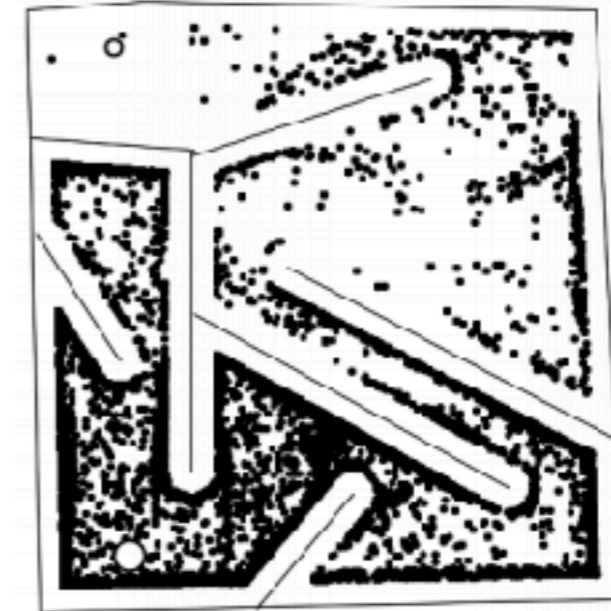
Skill/Knowledge



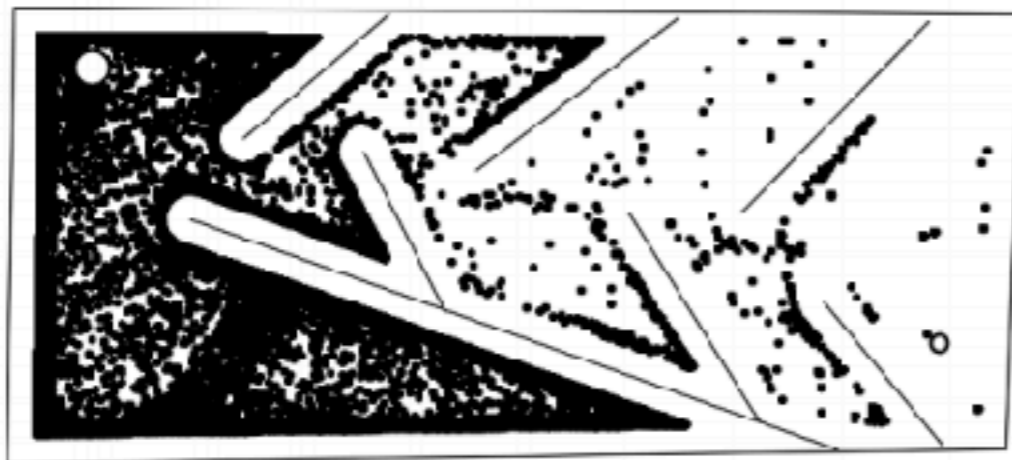
Novelty Search: Better than goal-directed!?



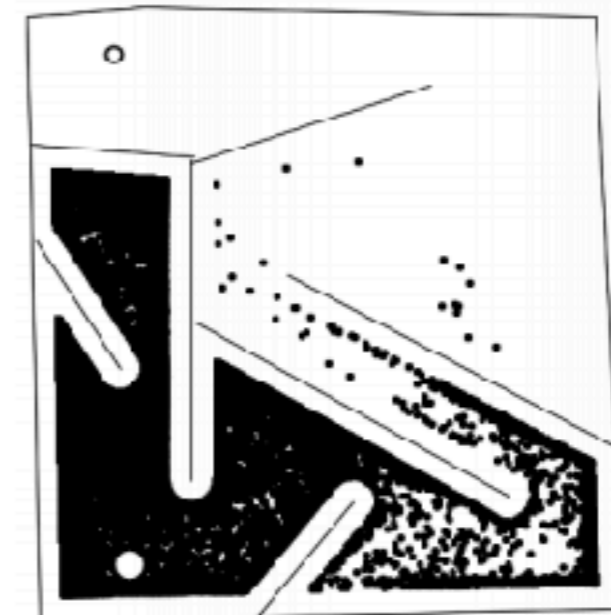
(a) Medium Map Novelty



(b) Hard Map Novelty



(c) Medium Map Fitness



(d) Hard Map Fitness

Towards Artificial Improvisation in I-A DEs

Do we really need improvisation or is creativity enough?

Hybridise creativity/improvisation with “rote” development?

Lower latency and reactivity to Artificial Agent may not be enough;
what about group improvisation and performance aspects?

What are the core algorithms for Artificial Improv?

How to combine direct manipulation and AImprov?