

LAST WORD: THE PATH TO INNOVATION

by Stefan Gruner

Ten years ago, in 1997, Gregor Snelting issued a serious warning about quackery and insignificant "results", due to a rising tide of *Feyerabendianism* in academic software engineering, in a position paper submitted to a relatively unknown German IT magazine, *Softwaretechnik Trends*. Snelting's article reappeared in a more accessible English translation in 1998, and in 2001 he published a retrospective on developments in the field since then.

Paul Feyerabend, a philosopher of Austrian origin, assumed an extreme position of postmodern relativism (respectively social constructivism) as far as the notions of scientific method and scientific truth are concerned. The sound waves of his "big bang" are still resonating more than 30 years after his seminal book *Against Method* was published in 1975. This book is arguably still regarded as the most significant end-point of a trail of post-World War II philosophical thought that started with Karl Popper's critical rationalism in 1935 and the work of Thomas Kuhn and Imre Lakatos in 1962 and 1970 respectively. As the book title suggests, it advocates a "no method at all" approach of deliberate arbitrariness as far as scientific work and research is concerned.

However, even after Snelting's warning and retrospective article in *Softwaretechnik Trends*, a group of young, mostly unknown software engineers were able to launch a workshop on Feyerabendianist software engineering under the umbrella of the reputable European Joint Conferences on Theory and Practice of Software (ETAPS) in 2003.

In their motivation statement on their workshop website those computer scientists claimed: "Fifty years into the first computing era, some of us in the computing arena have realised that we made a false start that cannot be fixed. (...) To finally produce lasting, correct, beautiful, usable, scalable, enjoyable software that stands the tests of time and moral human endeavor, we need to start over. Perhaps we will be able to salvage some of what we learned from the first era, but we expect almost everything except the most mathematical and philosophical fundamentals to be brushed aside. The Feyerabend Project is an attempt (triggered

by Richard P Gabriel) to repair the arena of software development and practice. This workshop is one in a series leading to an event to reinvent computing. For that event, a most diverse group of 75 people will be put together. The result of the two-week event will be the first steps toward a road map for massive rebuilding of computing – both as a theoretical endeavor and a practice – and toward a plan to accomplish it."

The impact of that workshop seems to have been rather low, and with some good reason we may well be skeptical as far as the belief is concerned that *everything* that we have done so far in computer science and software engineering was *fundamentally* wrong – not to mention, of course, the countless little errors which have necessarily been made on the way to innovation.

In contrast to the above-mentioned "Dreamsong" project, I would suggest a different path to innovation, a path inspired by a pivotal event in the history of our sister science, Mathematics. Almost 100 years ago, no one other than David Hilbert pondered the 10 most urgent mathematical problems of his time. Being an eminent scholar of his time, Hilbert had the "natural authority" to announce an unprecedented research project, calling for the joint effort of all mathematicians towards the solution of those 10 problems. Enormous scientific progress resulted from that project with a highlight of the project being the discovery that Hilbert's tenth problem was indeed unsolvable, as proven by Kurt Gödel in 1931 – only a few years before the establishment of the related computer science as a new science of its own.

What we need in our much diversified computer sciences and software engineering practices today is not another Paul Feyerabend advocating even more relativism and further arbitrary procedures, but a new David Hilbert – someone with the ability of clearly pointing at the 10 most urgent problems in computer science as well as the "natural authority" to call for joint efforts on the solution of these problems.

Although I am not 100% certain whether Tony Hoare with his *Grand Challenges*

really is such a 'new Hilbert', his ideas have at least inspired a new series of conferences on this topic, namely the conferences of the Computing Research Association (CRA) on grand research challenges in computer science and engineering. Every young computer scientist in search of a significant PhD topic should have a look in this direction before getting lost in the labyrinth of arbitrary possibilities. Though not every problem will turn out to be eventually solvable, major "spin-offs" can reasonably be expected even from the unsolvable ones. ☺

Literature

Dreamsongs. [Online] Available: <http://www.dreamsongs.com/Feyerabend/ETAPS03/>.

ETAPS. 2003. [Online] Available: <http://www.mimuw.edu.pl/etaps03/Workshops/workshop-frame.html>.

Feyerabend, P. 1975. *Against method*. London.

Gödel, K. 1931. Über formal unentscheidbare Sätze der Principia Mathematica und verwandter Systeme. *Monatshefte für Mathematik und Physik*, 38, p.175.

Kuhn, T. 1962. *The structure of scientific revolutions*. Chicago.

Lakatos, I. 1970. Falsification and the methodology of scientific research programmes. In: *Criticism and the Growth of Knowledge*. Edited by Lakatos & Musgrave. Cambridge.

Popper, K. 1935. *Logik der Forschung*. Wien/Vienna.

Snelting, G. 1997. Paul Feyerabend und die Softwaretechnologie. *Softwaretechnik Trends*, 17/3, Aug.

Snelting, G. 1998. Paul Feyerabend and software technology. *Software Tools for Technology Transfer*, 2/1, pp. 1-5, Nov.

Snelting, G. 2001. Feyerabend – zwei Jahre später. *Softwaretechnik Trends*, 21/1, Feb.

The CRA Conferences on Grand Research Challenges in Computer Science and Engineering. [Online] Available: <http://www.cra.org/grand.challenges/>.

Stefan Gruner received both his MSc (1996) and his PhD (1999) from the Technical University RWTH Aachen, Germany. He is currently a senior lecturer with the University of Pretoria's Department of Computer Science, (special area of interest: Software Engineering). He is also a student of Philosophy with the University of Hagen, Germany, (special area of interest: Philosophy of Science).

sg@cs.up.ac.za