The Publishing vs Patenting Dilemma

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The Background

In 2001, Moskewicz et al., presented the paper "Chaff: Engineering an Efficient SAT Solver" at the 39th Design Automation Conference.

- The authors improved upon a well-known Boolean constraint propagation technique ("head-tail lists"), naming their improved method "watched literals".

- The algorithmic details of the watched literal method were outlined, and the source code of the Chaff solver was made publicly available.

- Subsequently, the watched literal method became a de facto standard in SAT solver design, as it offered substantial improvements in efficiency.

The Problem

In the **summer of 2008**, it became widely known within the SAT community that the authors had, in **September of 2002**, filed an application for a U.S. patent (subsequent to a provisional application filed **September 2001**).

This patent explicitly covered not only the Chaff solver, but methods pertaining to its operation, including but not limited to the implementation of watched literals.

Statement from the Authors

Here is a statement from Sharad Malik, one of the original authors, regarding the consequence of such patent for academia:

"The chaff software and related intellectual property have been freely available for research purposes and will continue to be available for free use by the research community for non-commercial purposes. This includes the development of other SAT solvers with this technology as well as their research use.
(See http://www.princeton.edu/~chaff/zchaff.html. for all terms and conditions).

For commercial use of this technology please contact John Ritter (jritter@princeton.edu) in the Office of Technology Licensing at Princeton University."

Ethical Issues

In this case, the **problem owner is the authors of the solver.**

Setting aside legal issues surrounding the issuance of a U.S. patent for an algorithm, two interesting ethical issues arise:

- Is it ethical to assert ownership of an idea (i.e., by seeking patent protection for intellectual property), while simultaneously seeking scientific and/or academic kudos for it (i.e., by publishing the results in the public domain)? Can intellectual property be both public and private?

- What are the ethical ramifications of making an idea publicly available for replication/extension, while secretly moving to ensure private control of that same idea?

Stakeholders and Interests

Authors of the solver
- reputation
- financial benefits
- ownership
- option to control use

University
- increase academic reputation
- spin off profitable ventures
- make money

Customers
- Convenience
- Service
- cheap software

Researcher
- improve my idea
- access to low cost tools
- make their own tools

Industry
- low cost
- connection to research community
- avoid lawsuits
- profit
- no dependency on a third party

Open Source Developers
- avoid using patented code
- encourage community development

Options for the authors

- Patent

- Publish

- Publish and Patent (openly)

- Publish and Patent (sneakily)

- Don't do anything

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Patent, Publish or Both

- The options to openly patent, publish or both are harder to distinguish between, as they all have positive and negative aspects.

- So, if we view the problem from a Utilitarian perspective, it basically boils down to how we would like to distribute the positive and negative effects.

Patent, Publish or Both

- Patenting would be economically beneficial for the researchers and their university, but negative for everyone else. It would not provide any benefits concerning the academic reputation of the researchers or the university, more likely it will have a negative impact.

- Publishing would not be as economically beneficial for the researchers and their university as there will be no income from licencing fees. But on the other hand publishing will increase their academic reputation which in turn might provide more lucrative funding opportunities. Since the method would be freely available to use in commercial software, the industry will profit. The open source community and research community would be able to make use of the method as well.

- Patenting and publishing is a middle-ground solution which redistributes economical benefits back to the researchers and the university from the industry while still keeping some of the benefits of publishing intact; mostly for the research community and open source community.