

The BREW workshop series: a stimulating experience in PhD education

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Abstract

Over recent years, five European PhD programmes have organized a series of 'Bioinformatics Research and Education Workshops'. These workshops address the needs of first-year PhD students and have been designed to combine a maximum of educational impact and scientific stimulation with a minimum of financial and administrative effort. We describe the BREW experience and argue that this type of event constitutes an attractive component of PhD education in computational biology and beyond.

Keywords: *Bioinformatics Education; PhD student conference*

BREW GOALS AND PARTNERS

It is generally agreed that young scientists need opportunities and practice in communicating their work, making international contacts, writing and reviewing scientific articles and organizing scientific meetings. A recent essay by Tomazou and Powell [1] lists a variety of events that focus on the issue of improving these skills. Some, such as the 'Crossroads in Biology Colloquium' in Cologne (<http://crossroads.uni-koeln.de/mission.php>) address a PhD student audience, combining invited presentations from established researchers with a few student talks

(<http://crossroads.uni-koeln.de/mission.php>) and offering an open mode of registration. Some have mainly PhD students as speakers and the students also organize the meeting, such as the Sanger-Cambridge PhD Symposium (<http://www.sanger.ac.uk/Info/Events/scamps>) with registration restricted to students from local research units. The BREW activity we are going to describe here shares the goals of the aforementioned events, but is organized in a distributed, low-budget fashion, which could easily be adopted by other providers of PhD education.

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Esko Ukkonen is Professor of Computer Science at Helsinki University. His interests cover combinatorial pattern matching, design and analysis of algorithms, machine learning and computational biology in general. He has been directing the Graduate School in Computational Biology, Bioinformatics and Biometry, including PhD students from Universities in Helsinki, Turku and Tampere.

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Table 1: PhD programmes participating in BREW

PhD programme	Partner site	Approx. no. of PhD students (as of 2007)
Molecular and Computational Biology Research School	Bergen University	15 (bioinformatics branch)
Max Planck Research School for Computational Biology and Scientific Computing	Max Planck Institute for Molecular Genetics, Berlin	20
International Graduate School in Bioinformatics and Genome Research	Center of Biotechnology, Bielefeld University	25 (bioinformatics branch)
Graduate School in Computational Biology, Bioinformatics and Biometry	Helsinki and Turku Universities	22
EBI PhD programme (part of the EMBL International PhD Programme)	European Bioinformatics Institute, Hinxton	26

Table 2: BREW events 2002–2007

Year	BREW site	Participating programmes
2002	EBI	Bielefeld, EBI, Helsinki
2003	Bielefeld	Bergen, Bielefeld, EBI, Helsinki
2004	Helsinki	Bergen, Berlin, Bielefeld, EBI, Helsinki
2005	Berlin	Bergen, Berlin, Bielefeld, EBI, Helsinki
2006	EBI	Bergen, Berlin, Bielefeld, EBI, Helsinki
2007	Bergen	Bergen, Berlin, Bielefeld, EBI, Helsinki
2008	Bielefeld	in planning

In the late nineties, many European universities made strong efforts to establish bioinformatics curricula on the undergraduate and graduate level. The idea of an inter-national series of workshops designed to foster PhD student education came up in 2001, when the authors were directing PhD programmes in bioinformatics at major European research institutions (see Table 1).

The goals of the ‘Bioinformatics Research and Education Workshops’ (BREW) are:

- (1) We want to give our PhD students, early in their projects, some experience with all aspects of international scientific conferences – from a contributor’s as well as from an organizer’s perspective.
- (2) We want to bring together the PhD students with renowned researchers and with their peers from other sites, to provide feedback and inspiration that may influence the course of their projects.
- (3) We want to foster scientific discussion across sites and initiate research cooperations, possibly leading to student exchange.
- (4) We want to provide for ourselves a forum for exchange of experience on all matters of designing and running graduate curricula in bioinformatics.

Such goals are lasting concerns in PhD student education, and this report describes how they are pursued by the BREW activities. Tables 1 and 2 summarize BREW partners and events, and at the end, we provide links to the BREW conference WWW pages.

A first consequence of these goals is that BREW provides a ‘sandbox-model’ of an international conference. Although BREW is designed to prepare the students for the competitive real-world of science as it is organized today, the cooperative aspect of science takes precedence over competition within BREW.

A second consequence of our goals is that BREW, by construction, is invitation-only—a cooperative activity of the five partner programmes. It does not address individual PhD students elsewhere. This is why you, the reader, probably have never heard of it, and is why we feel we should share our positive experience via this article. Ideally, this will prompt other colleagues to copy the scheme and create independent BREWs.

BREW FORMAT

Looking at the conference programme, a BREW event resembles many other scientific conferences: A 2–3 day meeting with international participation, some invited talks and about 25–30 presentations of submitted papers. The talks touch many areas of bioinformatics, and are organized into thematic sessions. Extended abstracts are available in a proceedings volume (to participants, but not publicly), and there is a conference dinner and an informal welcome event.

So what is special about BREW?

All the submitted presentations come from the first-year students in the participating PhD programmes. ‘First year’ is interpreted liberally as 6 to 18 months into the PhD project. Typically, a well

motivated and clearly defined research problem must be stated, and first results presented. Presentations are short and ample room for discussion is provided. The audience is dominated by the PhD students, with some other students from the local university's M.Sc. programme sneaking in. We also bring along a few highly motivated students too 'young' to present at BREW, and some more advanced PhD students (with BREW experience) to take part in the discussions. This practice helps to conserve a certain BREW spirit from meeting to meeting. Finally, one or two PhD student advisors from each participating programme are also present.

Sharing ideas and preliminary results of early-state PhD projects may seem undesirable to some, worrying about eventual chances of publication. Indeed, occasionally some PhD projects appear to address the same question with similar approaches. We see this as a positive chance to learn about this situation early. Advisors may react and adjust the directions of these projects such that they become complementary rather than redundant efforts.

The invited speakers are chosen from the established researchers in bioinformatics or molecular biology at the host site. Typically, the invited speakers provide an overview of their recent research, but sometimes we also had talks tailored to this specific type of audience. To give two recent examples: at BREW 2006, Tim Hubbard (Wellcome Trust Sanger Institute) gave an insider talk on the negotiations and policies of journals (such as Nature and Science), funding agencies (such as NSF and NIH) and major research institutes (such as the Sanger Institute) concerning the issue of open access publishing, a topic the students had barely started worrying about. At BREW 2007, Rein Aasland (University of Bergen) gave a talk about the dialectics of questions and devices in molecular biology research, and future tasks for bioinformatics, which truly enticed the participants.

There is no need felt for a poster session at BREW, because most of the participants present their work orally.

BREW ends with a wrap-up session, where the quality of the oral presentations and discussions is analysed: types of questions asked from the (small but international) audience, speakers' reactions to questions, interaction with the session chair, distracting attitudes, making best use of local media facilities, integrating thoughts and lessons from talks heard earlier and the like—these are issues that cannot be

really learnt in the weekly seminar at home. As some students also have acted as session chairs, a good part of the session is devoted to their performance, which is also instructive for all, and fun.

BREW FUNDING

When the BREW idea of a long-term cooperation in bioinformatics education was born, there was no European funding programme applicable to this idea. Instead, the concept was developed to make BREW a low-budget event.

Taking place at one of the partner sites, we can cheaply access the host institution's facilities. No travel and accommodation costs are incurred by the hosting site. Invited speakers are recruited from the local colleagues. Since the audience changes over the years, as students leave and enter the PhD programmes, there is no boredom in having the meeting rotate through the participating sites. Visiting partners have to cover their travel costs from their local budget (which sometimes limits the number of students we can bring to a meeting).

The relative vicinity of the BREW sites (Bergen, Berlin, Bielefeld, Helsinki and Hinxton can all be ascribed to the northern half of Europe) also helps to keep travel costs moderate. This aspect has kept us from addressing potential partners farther overseas.

A mundane aspect of this low-budget strategy is that under the academic evaluation schemes that are currently popular, which focus on publications and acquired third-party funds, an engagement in a BREW-type activity does not strengthen your records. It takes a group of tenured faculty to set up and sustain this type of cooperation.

ORGANIZING A BREW EVENT

In setting up the annual BREW event, a senior PhD student at each site acts as the local organizer and distributor of information. The hosting site prepares a WWW conference page and issues a CfP, calling for abstracts of 3–5 pages length.

PhD students apply to their local PhD advisors for BREW participation. They determine which students should submit papers. It is known in advance that all submitted papers will eventually be accepted. We are not practicing the experience of frustration. Submitted papers are redistributed by the host site for anonymous review by other authors in a round-robin fashion. Local advisors help the students in

writing good reviews, as for most of them this is a first time experience.

This practice, aside from its educational impact, also has a beneficial effect on the quality of questions and discussions during the presentations, as some people in the audience have already carefully read the abstract related to a talk. At the conference, the reviews are often mentioned as very helpful, and reviewers tend to throw off the mantle of anonymity in favour of unrestrained discussion.

As the intentions and rules of BREW are already known to the PhD students, this organization scheme requires minimal effort on the side of the faculty. This smoothness results from the fact that BREW addresses PhD programmes rather than individual PhD students, so the local accumulation of BREW experience is passed on between generations of participants.

CONCLUSION

The BREW model can hardly be expanded in size—a larger conference would mean higher cost and effort, more time and probably lose much of its intense and stimulating character. However, we feel that events of this type could be organized by other groups of PhD programmes in bioinformatics

and beyond, much to the benefit of their PhD students.

Links to Previous BREW Meetings

- 2007: <http://www.cbu.uib.no/BREW/>
- 2006: www.ebi.ac.uk/~gaudan/BREW2006/
- 2005: <http://cmb.molgen.mpg.de/brew/>
- 2004: http://www.cs.helsinki.fi/hiit_bru/brew2004/
- 2003: <http://www.techfak.uni-bielefeld.de/GK635/termine/workshops/brew2003/>
- 2002: <http://www.ebi.ac.uk/microarray/General/Events/BREW/BREW.html>

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Reference

1. Tomazou EM, Powell GT. Look who's talking too: graduates developing skills through communication. *Nat Rev Gen* 2007;**8**:724–6.