4th Workshop for Doctoral Students in Object–Oriented Systems
Held in Conjunction with ECOOP'94 in Bologna, Italy

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Abstract. This is a brief report on the 4th Workshop for Doctoral Students in Object–Oriented Systems held in conjunction with the ECOOP conference series. The workshop consisted of different sessions dealing with technical topics, managing the information floods in the field of object orientation, the Ph.D.–students network, and reflection on improvements for further workshops in this series. We consider the workshop to be very successful. This is indicated by the amount of discussions it inspired and the plans for longer and additional meetings.

1   Introduction

In conjunction with ECOOP'94, a one–day workshop for 23 Ph.D. students, mostly from European universities, was held. The workshop was the fourth in a series which started at ECOOP'91. They are intended to advance the personal and professional development of Ph.D.–level students working in the field of object–oriented systems. The workshops are a unique opportunity to meet, to discuss research, and to further develop working skills. Their uniqueness is due to the setting of mostly–equal participants in which the academic competition plays only a minor or even no role at all. The 4th workshop had, like the ones before, an interactive form where the participants worked in small groups most of the time. The results of these small groups were presented to the other participants in plenary sessions.

To participate in the workshop, the attendants had to submit short abstracts of their research work which were distributed electronically to all participants prior to the workshop. The abstracts served as a first mutual introduction as well as a basis to participate in the network of Ph.D. students in object–oriented systems (PHDOOS) which will be introduced in Section 4.

The day was divided in four sessions of 90 minutes, according to ECOOP's general workshop schedule. In the first session, an idea which arose at the 3rd workshop has been successfully realized: the participants mutually introduced themselves by short talks restricted to three minutes per person. This strategy has been considered valuable, because it provides more information than simply name and affiliation and is a good exercise for abstracting the basics of one's personal work, while it does not consume excessive amounts of time.

The following sessions covered: the technical discussions, "keeping up with the information flow", the PHDOOS network, and reflections on the workshop itself. They will be described in the remainder of this report.

There is an accompanying paper called the "ECOOP'94 PhDOOS Member Report". It covers the discussions of the workshop with much more details than could be presented in this report. The Member Report is electronically available via anonymous FTP at: ftp.uni-erlangen.de:/pub/doc/PhD-Network/doc/WSMemberReport.94.ps.Z.

2   Technical Discussion

Prior to the workshop, the attendants were asked to submit keywords denoting topics they are interested in being discussed. This procedure has proven to be effective. So, the following five topics could be determined in advance and corresponding groups could be formed almost immediately:

- OO in Concurrency, Distribution, Real–Time
- OO Modelling, Analysis, Design, Frameworks
- Object Relationships, Reflection, Sharing, Hierarchies
- OO Specification, Prototyping
- OO and Compilers

As in the workshops before, IPA (issue–position–argument) forms were used to find interesting and controversial issues. Each person should write an issue to be discussed on the form. Issues should be like questions which can be answered "yes" or "no". Answers to that question are called positions. Arguments support a position and explain why a position is right. To get a discussion started, the forms were shifted to the next member of the group. Everyone should find more positions and

arguments to the issues given. After completing the shifts around the group, a large number of positions and arguments came up which served as basis for the discussions.

The discussions were mostly passionate and appeared to be so valuable that the intended writing of discussion results had to be cut off due to restrictions on time. This problem has also been discussed in the session reflecting the workshop. Possible solutions can be found in Section 5. For this reason, we can only provide some "highlights" of issues discussed in the groups:

- OOA should be as formal as possible in order to be able to reason about it. Is it possible to come up with a proposal for such a formal process?

- Functional programming techniques, such as higher order functions, can improve OO modelling and programming. Are composition strategies more useful than class inheritance?

- Are OO languages inherently inefficient?

- What is the role of object orientation in building concurrent systems?

3   Keeping up with the Information Flow

The topic of this session arose from the problems which Ph.D. students typically have in the field of object–oriented systems with its rapidly evolving technology, theory, and terminology – resulting in almost overwhelming amounts of publications. The following issues can be identified as key problems.

- How can one keep up with the "state of the art"? Especially: How to decide which sources to read?

- How to avoid or deal with "concurrent" research? (Other people working on similar topics or having "the same ideas").

- Which role do one's own publications play? "Why", when, and where should one submit own results?

The topics were examined from three perspectives: First, Arjan Loeffen reported his experiences with his almost–complete dissertation. Next, Remo Pareschi, ECOOP's program chair, added valuable insights from his point of view of an experienced researcher. And finally, the workshop participants discussed valuable sources and strategies for dealing with information in small working groups.

Arjan Loeffen

Arjan gave a lot of advice in a more or less "axiomatic" form. We summarize his "highlights" below:

- If you take a topic that is completely new, get ready for many lonely hours. On the other extreme, if you take a topic that many people work on, get ready for an avalanche of information. It will then be hard not to end up writing a survey instead of a Ph.D. thesis.

- Let your friends into your research. Friends who "do not know what you are talking about" may ask the most valuable questions.

- If you intend to write late, based on technical reports or articles, 4 papers should be enough.

- Get yourself a good interface to the Internet. Check for discussion groups and list servers early. However, read the stuff selectively (consequently: sparsely).

- Concerning "concurrent research":
  "Whatever you think, someone has thought of it before."
  But: "Nobody has ever thought about it the way you think about it!"

- If you want your writings to be reviewed informally by distant collegues, do not expect them to react too soon. Furthermore, in the great electronic era the phone or a handwritten letter is the best ensurance you can get that he/she will reply (promptly).

Finally, Arjan concluded his talk showing a slide with Figure 1 which relates the role of different information channels varying over the time spent on the thesis.

Remo Pareschi

Remo opened our eyes for a different way to tackle the problem of selecting information sources. He divided the interesting issues for Ph.D. students in object orientation into new interesting areas (besides the traditional ones) and relevant publications.

In this intention, the new areas are intelligent agents, coordination theory, scripting languages, so–called componentware, and the field of groupware, workgroups, and workflow.

Complementary, relevant publications can be divided into the traditional ones (ACM, IEEE, ECOOP and OOPSLA proceedings. . .), new relevant *scientific* journals (like TAPOS), and important titles on commercial developments (like Release 1.0 or Patricia Seybold's monitors).
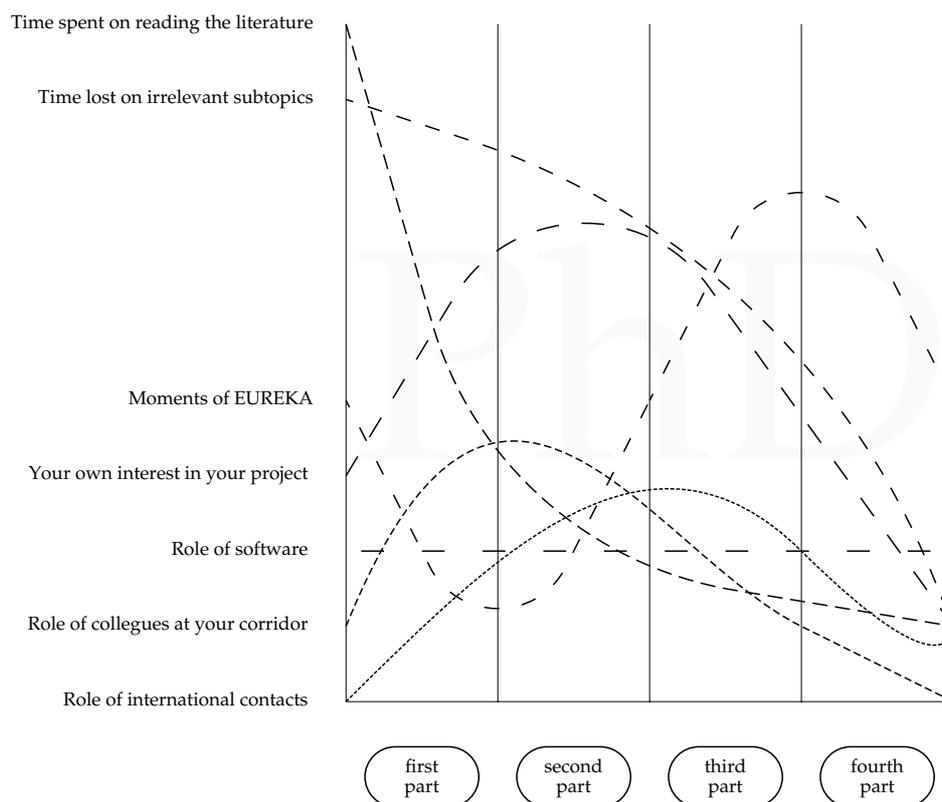
Figure 1: Importance of various information channels varying over time.

The Participants

The discussions in working groups showed, like the talks before, that the efficient management of the avalanche of information flows is a very hard problem. Consequently, the results are less in the form of well–formulated recipes. They can be grouped as follows:

Important information sources:

- Electronic media, like the World–Wide Web, Usenet discussion groups, archive services, . . .
- Books (classics are Booch, Jacobson, Meyer, Rumbaugh, Schlaer–Mellor, Wirfs–Brock, . . .)
- Proceedings of OOPSLA, ECOOP, TOOLS, . . .
- Journals like JOOP, Comm. of the ACM, Transactions of ACM and IEEE, ACM Computing Surveys, . . .

Useful hints:

- Do not start with publications on OO–topics *only*.
- Collegues may be very helpful giving you starting points for further readings.
- Start reading with classics or interesting papers. Continue by following the references in papers read so far.
- Make shortcuts: Read only title and abstract, or title, abstract, introduction, and conclusion. Strictly sequential reading is recommended for *really* important papers only.
- The number of *really* important publications for a Ph.D. work usually ranges between five and ten. The problem is to find them!

Catalogue of mostly important publications. The final discussion concluded with the idea of collecting the sets of *really* important publications of all network members in order to form a catalogue of basically important publications in object orientation. This collection should help newcomers in the field as well as provide feedback to everyone's own knowledge. In the near future, it has to be investigated how such a collection of literature references may be maintained and accessed by a globally distributed group like ours.

4 The PHDOOS–Network

Thilo Kielmann introduced the network of Ph.D. students with the motto "How can we help each other in getting a Ph.D.?" The talk introduced purposes and available media and lead to a discussion on further use and developments.

The network has been founded along with the first workshop in this series at ECOOP'91. Since then, it has been served for various purposes like reviews on books, articles, or other papers, requests for comments on (draft) papers, requests for references to publications, discussions of technical topics, announcements for post–doc opportunities, discussions of problems with the Ph.D.–getting process, or even social interaction between network participants.

Currently, the following media are available to serve these purposes:

1. Mailing List. Here, all forms of discussions can be performed in the setting of a closed group of people all of them having more or less the same problems. The list can be reached at the address phdoos@informatik.uni-erlangen.de, administrative requests (like subscription or unsubscription) must be directed to phdoos-request@informatik.uni-erlangen.de.

2. No Usenet Newsgroup. Such a discussion group could serve the same purposes the mailing list does. But, opposed to it, a newsgroup would be inherently open to the public.

3. FTP Server. The FTP Server is used as an information repository for the network members. E. g., member abstracts and workshop documentation can be found here. The server can be accessed with an anonymous account at ftp.uni-erlangen.de:/pub/doc/PhD-Network.

4. World Wide Web Pages. The WWW server complements the FTP archive providing structured access to the files and a user–friendly interface. The information on this server is also part of our efforts to make the Ph.D. network widely known in the academic society. The server can be accessed at the URL http://www.informatik.uni-erlangen.de/phdoos.

The discussion on the network showed that the current setup seems to be quite suitable. Nevertheless, the session on the information flow induced some suggestions for additions to the WWW pages. Primarily, there should be some starting points for further information relevant from the viewpoint of Ph.D. students in OO. This concerns e.g. conference announcements, useful technical information, and material related to the Ph.D.–getting process. The intended catalogue of important publications might also be included in the Web.

5 Reflections

The final session was concerned with possible improvements for further workshops and the PHDOOS network itself. They considered the following topics:

Limited time

It became clear that the time available for technical discussions is too limited. However, there is little inclination to reduce the time spent on non–technical matters. It therefore became clear that one day is too short for the workshop. It was acknowledged by the workshop chair of ECOOP'95 that there is no formal reason not to extend the PHDOOS '95 to one and a half or even two days. If such a prolongation is decided, the additional time should be spent on technical matters.

Sharing information

In the session on the PHDOOS–network, it was generally agreed that locations of (electronic) papers and important references should be put on the WWW. Calls for papers encountered by members should be made available both on WWW and on mail. References of value to the members should be put on the mail together with a short summary (why one thinks it is a good or bad reference). More elaborate summaries can go on the web.

Local meetings

It has been suggested that (mainly) technical discussions should not be as "massive" as in the ECOOP workshop, but could be well prepared in local (maybe national) settings. Such national groups may be organized in the near future; first efforts in this direction are already in progress.

Acknowledgements