

**3rd Workshop for Doctoral Students  
in Object-Oriented Systems**

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August 1993

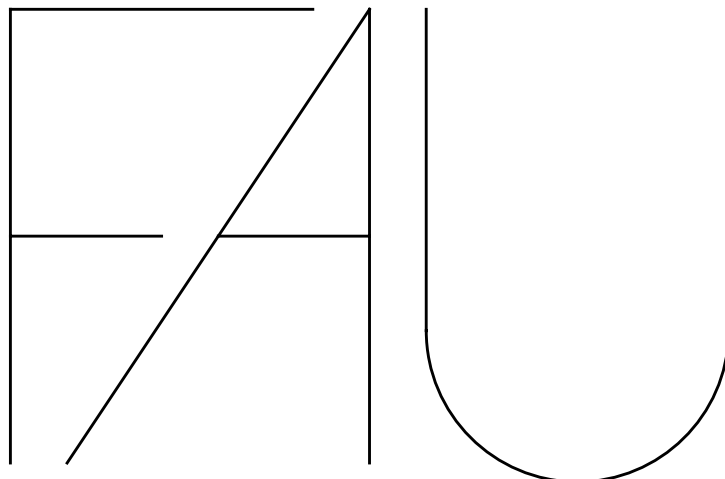
TR-14-7-92

**Technical Report**

Computer  
Science Department

Operating Systems — IMMD IV

Friedrich-Alexander-University  
Erlangen-Nürnberg, Germany



This paper will be published as part of other Workshop summaries of the ECOOP '93 in Kaiserslautern, Germany.

# 3rd Workshop for Doctoral Students in Object-Oriented Systems

Held in Conjunction with ECOOP '93 in Kaiserslautern, Germany

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**Abstract.** This is a summary of the 3rd Workshop for Doctoral Students in Object-Oriented Systems. This document presents the activities and results of the sessions of the workshop. In the Ph.D. network session the usage and evolution of the Ph.D. mailing list was elaborated. The corresponding chapter contains also an introduction to the goals of the list including the access rules. In the main non-technical session planning of research was discussed. The session was supported by an invited talk of Oscar Nierstrasz. The technical session practised the work in groups and the ability of writing.

## 1 Introduction

In conjunction with ECOOP '93 a one day workshop for 15 Ph.D. students was held. Most of the students came from European universities, but there was also a student from Canada. The workshop was the 3rd in a series of workshops held in conjunction with ECOOP conferences. 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 an opportunity to meet, to discuss research, and to further develop working skills. The 3rd Ph.D. workshop had, as the workshops before, an interactive form where the participants worked most of the time in groups. The results of the work in groups was always presented in a plenary session to all the other groups.

To participate at the workshop all attendees had to submit a one page abstract of their Ph.D. work which were distributed to all participants prior to the workshop and which served as a first mutual introduction of the participants. In the first session of the workshop the philosophy of the workshop was explained and the participants had the possibility to introduce themselves by a couple of sentences.

The day was divided in four sessions which are briefly introduced here and further explained in a separate chapter:

Session II was about the Ph.D. Network established after the 1st Ph.D. workshop. It is supported by a mailing list. The goal of this session was to elaborate the evolution and the usage of the network. In session III non-technical problems were addressed. the topic on this year's workshop was "Planning Your Research". A talk of Oscar Nierstrasz opened the session and the ideal research and the personal situation of the Ph.D. students were discussed in groups. Session IV was the technical session in which the participants were grouped according to their technical interests. In the groups the key issues of the chosen area were elaborated and evaluated. The final session V served as a reflection about the workshop.

## 2 Ph.D. Network

In this session the participants were introduced to an electronic mailing system, installed for technical and non-technical communication between Ph.D. students in object-oriented systems. The list was established after the 1st Workshop for Ph.D. Students in Object-Oriented Systems at ECOOP '91 in Geneva, Switzerland [1]. At the 2nd Workshop at ECOOP '92 in Utrecht, the Netherlands the Ph.D. mailing list was further evaluated [2].

The list is established for Ph.D. students in the object-oriented area. People who want to participate have to submit an abstract of their Ph.D. work to

phdoos-request@informatik.uni-erlangen.de

This is also the address for administrative questions about the list and for unsubscription. Contributions to the network should be mailed to

`phdoos@informatik.uni-erlangen.de`

and are automatically distributed to all network participants. The abstracts of the members are collected by the administrator and are sent to all network participants. The workshop participants participate automatically with their abstracts. Actually there are 73 members on the list, most of them participants of one of the Ph.D. workshops. There are 62 European, 1 Australian, 3 Asian, and 7 American members.

The suggestions for the use of the network can be collected as follows:

- Reviews on books, articles, conferences, workshops etc.
- Request for comments on (draft) papers
- Request for references to papers
- Discussions of technical topics
- Announcements for post-doc opportunities
- Discussion of problems in the Ph.D. getting process
- Social interaction between network participants

After this general introduction to the network the organizers reported about their experiences with the mailing list. The traffic on the list is low, but there have been some fruitful comments on draft papers and some exchange of pointers to the literature.

To begin some discussion about the usage and the goals of the network some questions were asked:

- Should the mailing list be opened e.g. as a new news-group `comp.object.phd`?
- Should the abstracts submitted by the members be made accessible? A public ftp directory and a document of the World-Wide-Web service (WWW) [3] were possible suggestions.
- How should it be possible to participate?
- What should the list be used for?

After some discussion in groups of four to five people the results were presented in a plenary session. All participants voted against a new news-group and for keep-

ing the mailing list with its formal subscription rule. There, discussions could be more open than on a news-group, e.g. the students could not imagine to ask on a news-group for some feedback on a preliminary paper.

Because a group of Ph.D. students has a very low half-life a consensus of a resubscription rule was found to keep the list free of uninterested people. Once a year, all members should renew their memberships by sending a note or better by sending an updated abstract to the administrator of the list (`phdoos-request@. .`). The renewal will be triggered by the administrator.

The submitted abstracts should be concise and short. Therefore, the length of the abstracts was restricted to 500 words. The workshop participants agreed that the abstracts should be available by a public ftp directory. This directory was established at

`ftp.uni-erlangen.de:/pub/doc/Phd-Network`

A document of the world-wide-web services would be very interesting and all participants were fond of the idea. The advantage of such a document is that it may be distributed on several sites and some of the members could administrate their contributions on their local site. Another advantage is that a WWW document allows a structured access to the abstracts. The disadvantage is that a lot of initial administration is necessary. At the university of Erlangen a WWW-server is running and the base document of the Ph.D. network will be added there. The WWW-server has the following address:

`http://www.informatik.uni-erlangen.de/phdoos`

A structured access to the abstracts of the members can also be provided by keywords which are assigned to the abstracts. Therefore, there will be a discussion on the mailing list about how to get a good set of keywords.

All attendees spoke for more publicity about the network. Suggestions were: posting on the news system and adding a note to the FAQ-document of the `comp.object` news group.

### 3 Planning Your Research

This session served to discuss the different aspects of planning a Ph.D. research project. Both general and per-

sonal aspects were discussed. The “senior” facilitator for this session was Oscar Nierstrasz. First Oscar talked about the general aspects of “Planning Ph.D. Research”, then the participants were asked to fill in forms with questions that covered personal aspects regarding the topic. The topics Oscar talked about were:

- Planning your schedule
- Choosing a thesis topic
- Doing Ph.D. research
- Writing the dissertation

Ph.D. research consists of different phases. Oscar identified essential phases of exploration and consolidation that should not be mixed. Apart from identifying different phases (literature survey, problem identification, project definition, experimentation, and consolidation), Oscar identified different checkpoints (project, proposal, research, outline, draft), and the different points where you will need guidance during your research (choosing your topic, determining your research plan, organizing and presenting your ideas, and deciding what is sufficient to get your Ph.D.). For this guidance one should not rely solely on the supervisor, but get as much advice from as much people as possible.

An important topic in the talk was that of searching for a “research menu”. In choosing a thesis topic one should focus on finding a promising **set** of research problems and solution approaches. This is important in not over-constraining the problem space that is being attacked. Also this enables you to switch tracks to maintain direction (e.g. switch tracks when you get stuck on a problem that is too hard). Identifying a research menu will also be important in the process of writing a thesis. It will allow writing the thesis as packaging. Other techniques to maintain direction are: keeping notes to avoid going in circles, and planning your route.

Oscar talked about writing a Ph.D. as packaging. If one has written diligently, then a thesis will largely be a re-packaging of previously written papers. Another remark was that writing a technical paper or a thesis is not writing a novel. A technical paper should be transparent. As a rule of the thumb one should: say what you’re going to say, say it, say what you’ve said. It is advisable to write as much as possible (papers) during the Ph.D. Re-

search. The more you publish, the easier it will be to write the thesis. Essentially a good written thesis must make an “original contribution” to the research field.

After the talk, the participants were asked to fill in forms with questions regarding their personal situation. Typical questions were “is there a formal/informal review process of your planning in your work group”, “what is your biggest obstacle in planning your research”. Subsequently these issues were discussed in three subgroups. Finally the results were discussed in the plenum.

One group created a list of guidelines for making a good planning (i.e. identify your problem domain, set goals, define checkpoints and milestones, document yourself, work in a team). The second group discussed group work versus singular work, and how checkpoints can be defined. The general feeling was that it is necessary to impose deadlines on yourself, but that in most cases deadlines are strictly connected to project funding. The third group made a list of research activities that must be planned and the time that must be allotted for each. The timing is based on a 4 year timescale (the typical timescale for a Ph.D.). The list consisted of:

- literature survey for choosing a topic (6 months)
- ongoing literature survey (7 months)
- planning (1 month)
- publications (3 months)
- research (24 months)
- contacting other researchers (1 months)
- writing thesis (6 months)

The general feeling in this group was that, although Ph.D. students are students, a very professional attitude towards the planning is necessary in getting the Ph.D.

#### 4 Technical Program

As in the workshops before, the technical program had the goal to generate some publishable statements. Therefore, the organizers suggested seven topics in the area of object-orientation.

- Specification and semantics
- Programming environments

- Concurrency and distribution
- Applications and object-oriented development
- Implementation strategies
- Integration of object-orientation and logic
- Programming languages

After some discussion, the participants chose the three most interesting topics to form three reasonable large groups of participants. The chosen topics were: specification and semantics, applications and object-oriented development, and programming languages.

As in the workshops before, IPA forms (issue–position–argument) were used to find interesting and controversial issues. The question to be answered by each group was: “What are the key issues in the chosen area of object-oriented programming?”. Each person should write one issue on the form. Issues should be like questions which can be answered with 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 given issues. After some time and some more shifts a large number of positions and arguments came up which were the basis for the discussion part of the technical session.

The discussions were very passionate and some people did not even want to stop for the most important part of the session: The groups should write some statements about the issues as a publishable text. Finally, in a plenary session the important issues and their positions as well as their arguments were presented.

In the next three sections the results of the groups are collected.

#### 4.1 Group A: “Specification and Semantics”

Members: Axel, Bernd, Luiza, and Hubert

*Should specifications be executable?*

This was the most controversial issue of the group. On one hand, specifications should be executable to allow the instant testing of the specified behaviour. On the other hand, specifications are intended to cover a certain level of abstraction which does not lead automatically to executable code. That is, specifications are intended to

specify **what** the behaviour of a system should be and **not how** this behaviour can be achieved. However, if the specification admits, it should be possible to transform the specification into executable code, but it is very questionable whether it is possible to generate efficient code out of specifications.

*Should specifications and semantics formalisms be as easy as possible?*

The consensus about this is yes, but specification techniques need a formal basis which might be complicated. However, users do not necessarily need to know about this.

#### 4.2 Group D: “Applications and Object-Oriented Development”

Members: Jawahar, Jérôme, Michael, Simon, and Stefanie

*Are OO-techniques suited for the development of user-tailorable applications?*

The general opinion in the group was that OO-techniques are suited for the development of tailorable applications. There is a number of reasons. First, there is a smaller semantic gap. As real world concepts are more directly modeled in applications developed using the object-oriented paradigm and the end-users can more easily identify what needs to be tailored. Second, existing parts of a program can be easily reused. The end-users can customize an application by specializing existing classes. Thus, the original class can be reused. Third, application-oriented languages can easily be created. Finally, constructs such as virtual classes and methods are an elegant means for implementing components that are open for future customizing. One of the problems with inheritance is that it can lead to non-obvious relationships and fragmented software components which makes it difficult for the end-users to understand the application. By the way, end-users are not necessarily programmers. Tailoring of an application can be done by a domain expert with some programming knowledge.

#### 4.3 Group G: “Programming Languages”

Members: Elizabeth, Markus, Niels, and Thomas

*Is there a need for application languages?*

Application languages are languages tailored for one specific application domain. Often they are more user-friendly and smaller than general-purpose languages and the compilers generate more efficient code, because they can handle a lot of the details of the problem domain. The drawbacks are that users have to learn a new language. The problem of compiler construction can be solved by tools for specifying application languages. Otherwise, class libraries and a good object-oriented programming language are an alternative to application languages. A programmer will mostly have no need for application languages because she can accomplish the same thing with the language and environment she is used to.

## 5 Reflection

In the last session the organizers asked three questions:

- What was the most impressive/relevant idea you heard today?
- How shall the workshop evolve?
- What can be criticized?

The most impressive idea of the day was for nearly everyone the interesting talk of Oscar Nierstrasz. For some people the discussions of the technical session were very fruitful.

The most mentioned critic of the workshop was the lack of time. The sessions were very tight. Some would like to discuss more deeply after the invited talk. Others thought the discussions about the Ph.D. network was superfluous.

For the evolution of the workshop some people stated that the mutual introduction was too short. Oscar Nierstrasz added that a presentation of exactly five minutes with about three slides would be a very good exercise. This suggestion might be realized at the 4th workshop at ECOOP '94 in Bologna, Italy.

## 6 Acknowledgment

We thank *Oscar Nierstrasz*, program chair of ECOOP '93, for his impressive talk at the workshop. Of course, we also want to thank all the participants of the work-

shop for their motivation and co-operation. The participants were: *Hubert Baumeister, Elizabeth Bjarnason, Stefanie Brünninghaus, Axel Burandt, Luiza Carneiro, Niels Elgaard Larsen, Paulo Ferreira, Jérôme Gensel, Thilo Kielmann, Markus Klingspor, Jawahar Malhotra, Bernd Müller, Simon Moser, Michael Weiß, and Thomas Wolff*. Finally, we thank *Jan Overbeck*, organizer of the 2nd Ph.D. workshop at ECOOP '92, who supported us with workshop materials and tips. In this tradition of supporting the next workshop we hope there will be two organizers who will do this interesting job for the 4th workshop at ECOOP '94.

## 7 References

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