



LarKC

*The Large Knowledge Collider
a platform for large scale integrated reasoning and Web-search*

FP7 – 215535

D8.1

Training Activities in LarKC

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EXECUTIVE SUMMARY

This document reports the training activities undertaken in LarKC until M6 (September 2008) of the project. It includes an overview of the internal and external training, educational activities and documentation, as well as training material generation and maintenance. In particular, the deliverable presents the LarKC PhD exchange program prospected to be implemented in the next reporting period. The initial aim of the program is to establish better communication and encourage knowledge transfer within the consortium by facilitating an exchange of PhD students and young researchers, between all LarKC partners. Following this the mid- to long-term aim of the program is to enable PhD exchange to organizations outside the LarKC consortium in order to disseminate the LarKC results to other organizations and provide training in the process of using the LarKC platform for research.

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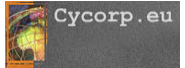








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Abstract (for dissemination)	<p>This document reports the training activities undertaken in LarKC until M6 (September 2008) of the project. It includes an overview of the internal and external training, educational activities and documentation, as well as training material generation and maintenance. In particular, the deliverable presents the LarKC PhD exchange program prospected to be implemented in the next reporting period. The initial aim of the program is to establish better communication and encourage knowledge transfer within the consortium by facilitating an exchange of PhD students and young researchers, between all LarKC partners. Following this the mid- to long-term aim of the program is to enable PhD exchange to organizations outside the LarKC consortium in order to disseminate the LarKC results to other organizations and provide training in the process of using the LarKC platform for research.</p>
Keywords	training, internal training, external training, LarKC PhD exchange program

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1 INTRODUCTION

The main goal of the Task T8.1 in LarKC is the implementation of a training program for internal and external purposes. This program provides interested audiences within and beyond the boundaries of the LarKC project a series of training activities ranging from general training (e.g., introduction to project-related areas, for the usage of the LarKC platform or for the development of plug-ins) to specific training in the techniques and tools developed in the project. Internal training targets primarily the case study partners. They require additional expertise on particular topics in order to ensure an effective and efficient operation of the respective empirical studies. In contrast, external training targets parties which are not members of the consortium, but are interested in the topics related to the project setting. External training includes educational activities (e.g., co-organization of summer schools and establishment of the LarKC PhD exchange program), but also the user and developer documentation of the LarKC platform and associated plug-ins.

This document is an accumulated report of the LarKC training activities. The corresponding materials will be regularly updated based on the user feedback received. The results of this interaction will be summarized in the versions of D8.1 due to M18, M33, and M42.

The current version of the document reports the training activities in LarKC till M6 (September 2008), including an overview of the internal and external training, educational activities and documentation, as well as training material generation and maintenance. In particular, the deliverable presents the LarKC PhD exchange program prospected to be implemented in the next reporting period.

2 INTERNAL TRAINING

The LarKC internal training is designed to deliver the background materials on topics such as reasoning, knowledge representation languages, semantic search, information retrieval and programming models for distributed systems to the LarKC members, so that the trainees can gain some necessary knowledge for the researches of the LarKC project.

Internal face-to-face trainings of case study partners on topics are relevant for the successful operation of the case studies. This includes the delivery of background material on topics such as reasoning and knowledge representation languages, focused training based on hands-on sessions and practical exercises to facilitate the usage of semantic technologies and tools (reasoning platforms, language-specific editors, validators, parsers etc.), and structured delivery of the case study process descriptions (in terms of main phases, phase transitions, data to be collected and measured in each phase, measurements and measurement tools and suites etc). The latter is aimed at ensuring a sound operation of the case studies and at easing the task of result collection.

Until M6 we have organized two main events of internal training:

- Internal Training Activities at LarKC Kickoff meeting.
- Internal Training Activities at LarKC Q2 meeting.

Those will be reported with details in the following.

2.1 Internal Training Activities at LarKC Kickoff meeting

The LarKC kick-off meeting was held on 15-17 April, 2008 in Innsbruck, Austria. One of the main issues in the kick-off meeting is to conduct an inter-disciplinary internal training. The topics of the internal training activities involve both basic technologies such as Parallelization, reasoning, selection and retrieval, abstraction and learning, and background knowledge of the case studies, such as cancer research use cases, Carcinogenesis Reference Production, Early Clinical Drug Development, and Ubiquitous City Services and Personalized Contents Delivery¹.

- Abstraction and Learning: Volker Tresp and Yi Huang of the LarKC Siemens Team presented a talk on Abstraction and Learning. They explored the relation between Machine Learning and the Semantic Web, and discussed the issue of Machine learning as an alternative to complex query / rule design and the issues of new technical challenges for Machine Learning in the Semantic Web. In the talk, they made a tutorial of various machine learning technologies, such as Relational Machine Learning, inductive logic programming, Relational Graphical Models, and Markov Logic Networks.
- Adaptive Memory. Lael Schooler (MPG) presented a talk entitled "Human Memory Adapts to Patterns of Information Use and Why (maybe) LarKC Should Too". This talk includes a tutorial of various heuristics in human cognition, such as Shaped by human abilities (Vision, Hearing, Attention, Memory, etc.), Cognitive Processes, Ecologically Rational, and Adaptive Toolbox.

¹<http://www.larkc.eu/publications/>

- Cancer Research Use Case. Angus Roberts, Yaoyong Li, Hamish Cunningham from University of Sheffield presented a talk on Cancer Research Use Case. In the talk, they analysed various scenarios of information retrieval in Cancer research, and provided a brief tutorial of the GATE system.
- Carcinogenesis Reference Production: James McKay of Genetic Epidemiology Unit of WHO presented a talk on Carcinogenesis Reference Production. The talk analysed various evaluation approaches of scientific literature in epidemiological studies.
- Data Integration and Reasoning Middleware. Atanas Kiryakov (OntoText) gave a tutorial of Data-integration and Reasoning Middleware, which includes the topics of ORDI, Rich-RDF, OWLIM, light-weight inference.
- DualRDF Spreading Activation over wRDF. Atanas Kiryakov's talk discussed various approaches of retrieval and selection, hybrid reasoning and IR models.
- Early Clinical Drug Development: Vassil Momtchev and Bo Andersson's talk discussed the use case challenge and objectives of the clinical drug development.
- Parallelization. Rolf Rabenseifner, from HLRS, gave a tutorial on parallelization, where he explained the basics of parallel programming, including different architectures and programming models. The tutorial took place in a plenary session with the presence of all LarKC partners.
- Reasoning: Frank van Harmelen (VUA) made a tutorial of reasoning in the Semantic Web. The topics include the main ideas of the Semantic Web, the knowledge languages of the Semantic Web, such as RDF/OWL.
- Urban Computing: Emanuel Della Valle (CEFRIEL) presented a talk on CEFRIEL's perspective on Urban Computing in LarKC.

2.2 Internal Training Activities at the LarKC Q2 Meeting

The LarKC Q2 meeting was held on 9-11 July 2008, in Amsterdam. The events of the internal training include the parallelization workshop and various WP meetings. In the following we will report the main events of the internal training activities: the Parallelization workshop and the training on various reasoning technologies in the WP4 Q2 meeting. Those internal training materials are available at the internal pages of the LarKC Wiki².

- Parallelization Workshop: Sabine Roller, from HLRS, organized a workshop on parallelization on 8 July 2008, Amsterdam. The aim of the workshop was to bring together the parallelization techniques in a high performance computing environment and the LarKC-like reasoning algorithms, in order to find a common language for the communication between experts coming from both worlds. The workshop was mainly targeted to LarKC WP5 partners

²<http://wiki.larkc.eu/LarkcProject>

and plugin-WPs leaders (WP2, 3, 4), although some other LarKC experts also attended. The workshop was also attended by non-consortium members of the high-performance computing group of VUA. This has led to further collaboration with this group for the purposes of LarKC.

- Reasoning (WP4 meeting): This training event consists of various talks in the WP4 meeting. The topics include Web Scale Reasoning and Approximate Reasoning (Zhisheng Huang, VUA), Granular Reasoning and Variable Precision Logics (Jia Hu, WICI), Resource Bounded Reasoning (Jose Quesada, MPG), Approximate Rule-based Reasoning (Florian Fischer and Barry Bishop, STI Innsbruck), Web Scale Reasoning from the perspectives of Human Intelligence (Peipeng Liang, WICI), Parallel Reasoning and Distributed reasoning (Axel Tenschert, HLRS) and Use Cases and Tasks (Annette ten Teije and Zhisheng Huang, VUA).

3 EXTERNAL TRAINING

External training is designed for interested parties regarding the technologies employed or developed throughout the project.

3.1 Plan of External Training Activities

- **Academic seminars / courses.** Academic partners in the LarKC consortium will include training activities on the project key features within their own institution programmes. They will be of different nature, depending on the type of audience that is intended to reach:
 - Regular Undergraduate Lectures
 - PhD Lectures and Activities
 - Postgraduate courses, in the scope of Masters and Specialities

In these areas, the academic groups working in LarKC are responsible for lecturing several subjects, where LarKC-related concepts are being introduced in a gradual way.

- **LarKC public workshops.** It is expected to organize dedicated LarKC public workshops along the project lifecycle. The workshops will mainly consist on topical presentations focused on the most relevant key features and innovations worked out at the moment to be held. Expected attendees to these workshops are:
 - Students from the hosting organization or from universities/centres external to the LarKC consortium.
 - Research audience: researchers from the LarKC partners and from organizations external to the LarKC consortium
 - Business audience: audience from the business units of the LarKC partners or external industry organizations interested on the exploitation of the LarKC results.
 - Early Access group: As this is a special target group for the LarKC results, a single section is dedicated for the detailed description of the training plan for this group (see section 3.4).
- **Cooperation with the EastWeb project.** The goal of the EastWeb project¹ is to build an integrated leading Euro-Asian high education and research community in the field of the Semantic Web, the next generation of the Web. LarKC has a plan to cooperate with the EastWeb project. Particular attention will be paid to training events in Asian countries, realized with the help of our Chinese and Korean partners. Their participation in the project opens new opportunities for the European reasoning and search community to outreach their technology towards two of the most rapidly evolving IT sectors worldwide. Elena Simperl (STI Innsbruck) is one of the organizers

¹<http://www.eastweb.eu/>

of the Asian Semantic Web School ASWS, which is organized together with EastWeb for the second time in December, 2008 in Thailand.

- **European summer Schools in the Semantic Web.** Further external training will be provided in the context of existing European summer schools such as the Semantic Web Summer School (SSSW) and the Reasoning Web Summer School. We will contribute to the organization of at least one summer school during the project runtime - in terms of tutors and teaching materials - in order to educate the young research community on the novel ideas and technologies emerging in LarKC project; and to establish the continuity of the research initiated in the project beyond its boundaries. An important part of the external training will also be to train potential beneficiaries of the LarKC platform on how to use it and to register and plug-in additional custom modules. In order to improve the quality of the materials documenting the usage and the further development of the platform the project Web site will contain a dedicated discussion forum for users to provide feedback on the quality of the documents delivered.
- **Participation of LarKC in external workshops.** LarKC will offer training activities (such as topical presentations on certain results of the project) in workshops organized by other projects/organizations.
- **PhD exchange program.** That is reported in the next section.

3.2 PhD Exchange Program

This section introduces the LarKC PhD exchange program, which will be setup within the first 12 months of the LarKC project. The major aims of the program are:

- The initial aim of the program is to establish better communication between the partners of the LarKC project by facilitating an exchange of PhD students and young researchers, between all partners in the LarKC consortium, to encourage a transfer of knowledge within the consortium. By establishing better communication within the consortium a better shared understanding of the research problems faced within the LarKC project will be reached and ultimately a better quality of research can be conducted resulting in better results from the LarKC project;
- Following this the aim of the program is to enable PhD exchange to organizations outside the LarKC consortium in order to disseminate the LarKC results to other organizations and provide training in the process of using the LarKC platform for research. Exchanging PhD students outside the consortium is crucial to ensure the acceptance of the LarKC platform as a platform for large scale reasoning research and will ensure the endurance of the LarKC platform as an infrastructure beyond the duration of the LarKC project. STI International will play a major role in this endeavor by establishing connections with organizations outside the LarKC consortium that are relevant for the topics of LarKC;

- Finally the longer term aim of the program is to establish lasting communication channels between the different organization, both within the LarKC consortium and external organizations, beyond the length and scope of the LarKC project. These lasting communication channels will enable better collaboration within the community and will be evident from the number of publications that will be created from cross organization authors. The exchange program will also support the Early Access Group, described in more detail in section 3.4, by raising awareness of the LarKC platform and disseminating results in a timely fashion to early adopters.

For the purposes of describing the PhD program we identify the following terminology:

- **Student:** The PhD student or young researcher who is taking part in the exchange program and is actually exchanged from one organization to another;
- **Students Organization:** The organization that the **Student** is affiliated with, both before and after the exchange;
- **Host Representative:** A person or persons who are affiliated with the **Host Organization** that will be the main point of contact for the **Student** during the **Hosting Period**;
- **Host Organization:** The organization that will host the **Student** during the **Hosting Period** of the exchange;
- **Hosting Period:** The period of time that the **Student** will be hosted by the **Host Organization**;
- **Research Topic:** The topic of the research, relevant to the LarKC work plan, that the **Student** will conduct in conjunction within the **Host Organization** during the **Hosting Period**;
- **Research Project:** An optional project in the scope of the **Research Topic** that the **Student** will conduct in conjunction with the **Host Representative** during, and potentially after, the **Hosting Period**;
- **Student Report:** The report that will be created by the **Student** and the **Host Representative** following the completion of the **Hosting Period** to report on the research conducted on the **Research Topic**, and potentially the **Research Project**, during this period.

The following guidelines are put in place for the purpose of establishing a PhD Exchange for a given **Student** with a given **Host Organization**, and ensuring its successful execution and completion. Deviation from these guidelines is possible only with agreement from the work package 8 leader and the LarKC Technical Project Management Board.

- An exchange must be defined a minimum of 15 days prior to its start and communicated to the LarKC work package 8 leader;

- The minimum **Host Duration** for a given exchange is 2 weeks, the recommended period is 1 month, while the maximum is 2 months;
- At this time the **Host Organization** and **Students Organization** are limited to academic partners within or outside the LarKC consortium. The program may be extended to non-academic organizations as the LarKC project proceeds. This extension would result in relevant personnel from both academic and non-academic organizations being exchanged for internships of a similar duration to the PhD exchange. It is envisioned that such internships will follow similar guidelines to those described in this section; however the guidelines will be evaluated when the program is extended to non-academic organizations.
- The **Host Representative** and **Research Topic** must be defined in advance of the exchange and the **Host Representative** should be a relevant person for the particular **Research Topic**;
- The **Research Topic** must be aligned with and relevant to the work plan of the LarKC Project;
- The **Host Organization** should provide the relevant working conditions for the **Student** during the **Hosting Period**. This covers but is not limited to a desk at wish to work and an adequate internet connection;
- The **Host Organization** should provide all the information needed by the **Student** in order to organize the exchange. For example the **Host Organization** should provide information on how to get to the organizations offices and information on accommodation during the **Hosting Duration**;
- The **Hosting Organization** should make all efforts to integrate the **Student** into their organization during the **Hosting Period**. While the **Host Representative** is the main point of contact for the **Student** it is intended that the **Student** should come in contact with as many persons from the **Host Organization** as possible in order to establish new collaborations and improve communication between the **Host Organization** and the **Students Organization**;
- The **Students Organization** is responsible for paying the costs relevant to the **Students** accommodation and travel during the **Hosting Duration**. These costs are then reimbursable against the LarKC project;
- An exchange may be defined in a bidirectional manner, where the **Host Representative** from the first exchange acts as the **Student** in the second exchange and vice versa;
- In the case of bidirectional exchanges it is recommended that a **Research Project** within the scope of the **Research Topic** is defined prior to the exchange starting, that spans the two **Hosting Periods**. Thus the first **Hosting Period** can act as a project kick-off and the second as a project wrap up with communication between the two **Students** occurring between the two exchanges;

- There is no limit to the time frame between the two **Hosting Periods** in the case of bidirectional exchanges, however it is recommended that the period between the two exchanges is not longer than 3 months;
- The **Student Report** should be made available to the LarKC work package 8 leader no later than 1 month after the completion of a given exchange by a given Student. The report should be created jointly by the **Student** and the **Host Representative** and should cover the research conducted during the **Host Duration** and any relevant research results, publications etc;
- In the case of a bidirectional exchange two **Student Reports** should be created, one for each of the exchanges.

The following table provides an overview of the current academic partners that will initially participate in the LarKC PhD exchange program. In each case the estimated number of exchanges to be made during the LarKC project is provided:

Students Organization	Number of Exchanges
STI Innsbruck	2
HLRS	2
Max-Planck-Institut	2
University of Sheffield	2
Vrije Universiteit Amsterdam	2
The International WIC Institute	2
CEFRIEL	2

The LarKC PhD exchange program will also run an annual PhD Seminar, where PhD students can present their current research on their PhD topic and receive feedback from the foremost experts in the field. Prior to the seminar, students will submit a report outlining the current state of their research and their future plans. These PhD reports will be reviewed by chosen experts from within the LarKC consortium or externally. A number of PhD students will be chosen to present their work at the seminar, those who are not chosen will receive written feedback in terms of the reviews to their PhD report. The PhD Seminar will run and each PhD student will present his or her current work in the form of a short presentation. The experts who performed the reviews will be present to give further feedback on the PhD Students current directions towards their PhD. The PhD seminar offers a great opportunity to students to get feedback on their thesis and to see the research of other students in order to get a clear understanding of the obstacles that they face and potential solutions to these obstacles.

One of the intended side effects of the exchange program and PhD Seminar is to establish joint PhD supervision in a cross organizational manner. When a given **Student** is exchanged from the **Student Organization** to the **Hosting Organization** a research topic may be established that has parts to both organizations. In such a case the given **Students** PhD thesis may become supervised by representatives of both organizations. In this way the PhD student will benefit from the knowledge of the representatives of both organizations and will result in a PhD of a higher quality. Also via the PhD student the level of cooperation and

communication between the two organizations jointly supervising the PhD will also be improved.

3.3 Training via the LarKC Wiki and Blog

The training activities in the LarKC Wiki and Blog can be considered as ones for both internal training and external training, because the information appear in the public pages of the LarKC Wiki and the LarKC blog are accessible for both internal members and researchers from the outside of the community. The LarKC Wiki² and the LarKC Blog³ have served as one of main channels for the communications between the researchers inside the LarKC project and the researchers from the outside of LarKC. The research resources which are collected in the LarKC Wiki and the discussions in the LarKC blog provide rich repositories of relevant research information. That is achieved mainly via the following approaches: Semantic Web Technology Hierarchy at the LarKC Wiki, Training material in the LarKC Wiki, LarKC Blog for Training, and the online video training.

- Semantic Web Technology Topics at the LarKC Wiki: The pages of the Semantic Web Technology Topics⁴ at the LarKC Wiki are designed to be a place for the LarKC community to collect different technologies and topics that are relevant to LarKC. So far the following topics have been created.
 - Adaptive Memory
 - Approximate Reasoning
 - Distribution and Parallelisation
 - Information Extraction
 - Thinking At Home
 - Triple Stores
 - Why We Need LarKC
 - Closed World Assumption and Negation as Failure
 - Librarianship: the Forgotten Silver Bullet
 - Granular Computing and Variable Precision Logic
 - Meta Reasoning
 - Contextual Reasoning
 - Module Reasoning
 - Rule-Based Reasoning
 - Resource-Bounded Reasoning

More relevant topics are expected to be added. Moreover, part of the content in the LarKC Survey deliverables such as D1.1.1 (Overview of relevant work in other areas) and D4.1 (A Survey of Web Scale Reasoning) will be converted and added into the corresponding Wiki pages after those deliverables are finished.

²<http://wiki.larkc.eu>

³<http://blog.larkc.eu>

⁴<http://wiki.larkc.eu/TechnologyTopics>

- Training material in the LarKC Wiki. The LarKC Internal Training Wiki page ⁵ collects resources for mutual education of the LarKC partners. The External Training wiki page ⁶ will eventually contain material for educating external parties on how to use the LarKC platform.
- LarKC Blog for Training. The LarKC Blog serves as a forum for the LarKC researchers.
- Online video training. The training page provides some links to the external online videos, which include Video Lectures on the Semantic Web⁷ and Video Lectures on Search Engines⁸.

3.4 Training for Early Access Group

LarKC will create a **Researcher Early Access Group** that will be open to participation to scientists working in related fields. Members of this group will get early access to project infrastructure and will be invited to experiment with plug-ins on the collider. Plans for training the members of the Early Access Group have not yet been finalised, but the following options are considered:

- programming by example: providing a set of pre-programmed open-source plugins that the Group members can adapt
- an instruction video explaining the overall LarKC plugin architecture, and the general design motivations behind it. This is easier to get across in a spoken then in a written medium
- joint programming sessions: these are 1-2 day events where LarKC designers can instruct the members of the Group and do "physical handholding". Because of the high overhead of these events (time, travelcosts), we expect to do at most 1 or 2 of these
- home-visits: in order to get more people involved at each of the organisations participating in the Early Access Group, LarKC designers might visit those organisations on-site. This is more cost- and time-efficient for the Group members then the joint programming sessions.
- textual material: we will make extensive use of the LarKC wiki for publishing on-line documentation, both on the plugin interfaces and on example plugins already written. We will use the wiki facilities for collecting feedback and improvements on this documentation from the Group members. (This should prepare the documentation for wider exposure at a later stage).

⁵<http://wiki.larkc.eu/InternalTraining>. The pages under the folder 'InternalTraining' are designed to be internal ones which are accessible by internal members only.

⁶<http://wiki.larkc.eu/ExternalTraining>

⁷http://videlectures.net/Top/Computer_Science/Semantic_Web/

⁸http://videlectures.net/Top/Computer_Science/Search_Engines/

4 CONCLUDING REMARKS

Since the LarKC project started just six months ago, what we report in this version of the document are mainly about the internal training activities and the plans for external training. More activities of external training and internal training will be regularly reported in the sequent versions of this document.