JUSTIFICATION FOR
TECHNICAL TRAINING SCHOLARSHIPS

The NeuroMAT project will aggregate tens of researchers and graduate students that will be dealing with innovative scientific research. Part of the scientific results obtained will lead to the development of software systems and tools. Such systems will be both used internally by members of the project as a means to carry on the project-related research as well as released as Open Source Software[1] on the Web portal of the project. This release as Open Source Software will be supported by the IME-USP FLOSS Competence Center (`http://ccsl.ime.usp.br`) whose director, Fabio Kon, is a member of the team of the project presented here.

In order to guarantee the quality of the development, use, and dissemination of the software components to be developed by the research team and its supervised students, the project will have the technical support of 3 trainees granted with TT-5 scholarships. These trainees will not only offer the support that is essential to the high quality of the products to be developed by the project but will also be trained in advanced techniques for the development and dissemination of software and digital media. Therefore, after the end of the project, they will be able to take leadership positions in teams dealing with the project, development, and dissemination of software, both within academic research projects and in the industry at large.

The first trainee will focus the activities on software architecture and development; the second will work on the packaging and dissemination of the software and on the creation and management of Open Source communities related to the project. Finally, the third will be in charge of management of the Web portal of the project, comprising its operation, the offer of multimedia digital content for scientific dissemination and academic support related to the results of the project.

According to the spirit proposed by FAPESP for technical training scholarships, we present below the activities to be engaged by each of the 3 trainees.

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[1]`http://www.opensource.org`

PLANNED ACTIVITIES
TT-5 trainee

Software architecture and development

The professional to be hired as trainee will have significant experience with (1) the development and architecture of object-oriented systems and (2) integration of software developed by different programmers. This professional will support the development of the software tools to be created by the project in its various research areas. The trainee will interact with the researchers and students of the project and will be responsible to help transform the scientific results of the project into computer systems and tools.

The planned activities are:

1. Definition, together with the project researchers, of the tools and systems to be developed as Open Source Software

2. Support in the agile modeling of the tools and systems to be developed during the project;

3. Support in the agile modeling of databases related to the project;

4. Continuous integration, on a central repository, of the components developed by the various students acting in the project; the trainee will not only help the student in the integration process but will also investigate the best forms of integration to avoid duplication of effort and refactoring the code to improve its quality;

5. Coordination of the developed activities with the researchers of the institutions partnering in the project, by means of face-to-face contact, videoconference, and tools for distributed collaboration (Wiki, Track, etc.);

6. Support in the preparation of scientific papers for national and international events as well as periodicals describing the implemented computer systems and tools.

The trainee will be prepared by means of the constant contact with researchers involved with Software Engineering and developers from the IME-USP FLOSS Competence Center. This will provide him with expertise on

agile software development, enabling him, by the end of the project, to lead high level software development teams.

Schedule:

Activities TT-5	Year 1		Year 2		Year 3	
	1st	2nd	1st	2nd	1st	2nd
Definition of the software	✗	✗	✗			
Agile modeling of the software	✗	✗	✗	✗	✗	✗
Agile modeling of the databases	✗	✗	✗	✗		
Integration of components			✗	✗	✗	✗
Support and continuous integration	✗	✗	✗	✗	✗	✗
Refactoring	✗	✗	✗	✗	✗	✗
Coordination of the development team	✗	✗	✗	✗	✗	✗
Support in preparation of national papers			✗	✗		
Support in preparation of international papers				✗	✗	✗

PLANNED ACTIVITIES
TT-5 trainee

Software testing, packaging, and distribution

The professional to be hired as trainee will have significant experience with (1) automated testing and (2) software packaging and distribution. This professional will offer support for the testing, packaging, and documentation of the software tools and systems to be developed by the project and will also help in the realization of computer experiments to be carried on. Finally, the trainee will help in the preparation of the experimental data to be published in the portal of the project in order to ease the reproducibility of such experiments by researchers outside the group.

The planned activities are:

1. Creation of distribution packages for easy installation of the software created by the project;

2. Support in the development of automated tests for the software, including: unit tests, integration tests, acceptance tests, and stress tests;

3. Test of the deployment of the tools on different operating systems (including Linux, MacOS X, and Windows);

4. Creation and maintenance of the documentation for the developed software;

5. Support in the preparation and realization of computational experiments.

The trainee will be prepared by means of the constant contact with researchers involved with Software Testing and developers from the IME-USP FLOSS Competence Center. This will provide him with expertise on Free Software testing, packaging, and distribution, enabling him, by the end of the project, to participate in innovative Open Source Software projects both within academic institutions and in the industry.

Schedule:

Activities TT-5	Year 2		Year 3	
	1st	2nd	1st	2nd
Creation of distribution packages	✗	✗	✗	✗
Development of automated tests	✗	✗	✗	✗
Deployment tests		✗	✗	✗
Documentation	✗	✗	✗	✗
Computational experiments		✗	✗	✗

PLANNED ACTIVITIES
TT-5 trainee

Dissemination of results in Web portal

The professional to be hired as trainee will have significant experience with the use and development of Web Content Management Systems, as well as basic development and system administration skills. This trainee will work in activities of support for the researchers and coordination of the development and evolution of the project's Web portal where the technological and scientific results will be disseminated as scientific papers, free software, open data, packages for the reproduction of experiments, and educational material.

This trainee will be in charge of the management of the project's Web portal, comprising its operation, offering multimedia digital content for the dissemination of scientific results, and support for education related to the results of the project.

His activities will be:

- Supervision of the creation and maintenance of the project's Web portal;

- System administration;

- Mediate the communication between the members of the project (scientists and students) and the company responsible for the implementation of the portal;

- Support in the preparation of free and open educational material and of the training courses related to the results of the project;

- Coordination of the activities developed with the researchers of the project, by means of face-to-face contact, videoconference, and tools for distributed collaboration (Wiki, Track, etc.);

The trainee will be prepared by means of the constant contact with researchers of the project and system administrators from the IME-USP FLOSS Competence Center. This will provide him with expertise on the deployment and maintenance of computer networks and software systems,

particularly with free software and web portals. By the end of the project, he will be prepared to participate in a wide range of related projects both within academic institutions and in the industry.

Schedule:

Activities TT-5	Year 1		Year 2		Year 3	
	1st	2nd	1st	2nd	1st	2nd
Creation of the portal	✗	✗				
Maintenance of the portal	✗	✗	✗	✗		
Interfacing scientists ↔ portal implementation		✗	✗	✗	✗	
Coordination among members of the project	✗	✗	✗	✗	✗	✗
Elaboration of multimedia educational content					✗	✗