Facilitating software learning via collaborative interaction histories

Duration   : 36 months
Team   : Loki (Inria centre at the University of Lille & CRIStAL)
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Location   : Inria Centre at University of Lille (Villeneuve d'Ascq)
Deadline   : 30/04/2024

The Loki research group is looking for a PhD student starting fall 2024. This PhD will investigate how collaborative interaction history, i.e. the recording of the actions performed on a shared document and of its intermediate states, could be implicitly distributed between collaborators and browsed on demand in order to learn how collaborators performed certain actions.

Context

Collaboration is at the core of many work-related activities, and it is frequent for several collaborators to work together on a project. Examples include developers collaborating on a software API, web designers editing a website mockup collaboratively using graphics-editing software, or communication consultants working on a powerpoint slide deck in the context of a contribution call. While these collaborators may work in the same domain and use similar tools, their skills and expertise with these tools may differ significantly, for instance knowledge of shortcuts or advanced features, efficient work habits, etc. Collaborative work is the perfect setup to transfer some of these skills to more novice collaborators, yet remote collaborative tools tend to focus on outcomes rather than methods, e.g. displaying only the changes in the shared document but instantly forgetting how these changes occurred. In practice, a significant opportunity of expertise transfer is lost among collaborators while working on collaborative projects.

Objectives

This PhD will investigate how software tools should be designed to facilitate the sharing of computing skills between collaborators. In that respect, the design of these software tools will target the following main objectives.

Supporting real-time sharing in real-time but distant collaboration. Collaborators can see the documents being modified but not how most of the operations are performed nor with which device or input method. It will investigate interaction and visualization techniques to display the methods, parameters and context used by one actor to their collaborators, either continually or on-demand. It will also explore tailored collaborative activities to foster the skill sharing in such synchronous collaborative environments.

Leveraging detailed interaction history to support off-line skills and methods sharing. Asynchronous collaboration is even more restrictive when it comes to disclosing how a change was performed: even when command histories are maintained across sessions, they only record "diffs" rather than detailed actions and commands. As a result, a collaborator studying such a command history might miss that an interesting tool or method was used. This PhD will investigate software architectures and interaction techniques to visualize and manipulate interaction histories from entire teams so they can be used asynchronously to discover and acquire novel computing skills.

Candidate

A successful candidate must be an excellent MSc student in computer science or equivalent, and show a great interest in performing high quality research in Human-Computer Interaction. He or she must demonstrate high skills in software development. Creativity, independence, team working and communication skills are valuable advantages.

The candidate will join a vibrant and multicultural group of young researchers at Loki. Our students typically come from different horizons (Germany, Colombia, Canada, China, France, …). As such, it is not required to speak French to fit in our group.

If interested in this project, simply e-mail Sylvain Malacria (sylvain.malacria@inria.fr) and Mathieu Nancel (mathieu.nancel@inria.fr) with the title of this PhD as subject. All applications are welcome, regardless of age, gender, social or ethnic origin, sexual orientation or disability.