Development of Debugging Tasks and Conducting a Pilot Study to Evaluate Educational Activities

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In the evolving landscape of education, programming skills have become increasingly crucial. One of the pillars of programming is debugging, which has been underevaluated until now. This is why we are exploring how to create effective debugging tasks and assess debugging skills using a variety of tools. The overall goal would be to analyze the differences in debugging strategies between experts and novices through a pilot study. This will assist us in developing systems and teaching approaches that help the learners to solve programming problems, which will be useful for schools around the world!
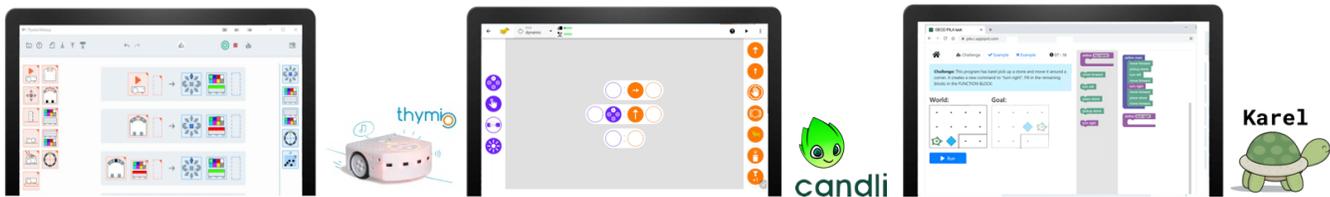

Figure 1: *Comparative Task Examples: Thymio (left), Candli (middle) and Karel (right)*

Your mission.

1. **Development of Debugging Tasks**: Create tasks specifically designed to assess and improve debugging skills in an educational setting.
2. **Utilization of Multiple Tools**: Integrate diverse tools, including Thymio, to offer a rich debugging experience.
3. **Design and conducting of workshops/studies**: Evaluate and iteratively improve the debugging activities.
4. If enough time, performing **learning analytics** on the data (user's action sequences in the system) collected from the workshops/studies to understand how different users (experts vs. novices) approach debugging across various platforms.

This is a multidisciplinary and cutting-edge project that integrates Learning Sciences and Computer Science. You will have the opportunity to work with people who have experience in similar projects for guidance and brainstorming. You will be given freedom in terms of proposing intuitive user interfaces, choosing the libraries, and designing systems. This is an ideal project for students interested in pedagogy and computer science with real impact.

Helpful (but not mandatory) prerequisites for students:
- Good coding skills
- Interest in pedagogy and learning activity design
- Basic knowledge in app development
- Proficiency in English; knowledge of French is a plus.