Overall, the activities of post-doctoral project will be twofold: (long term memorization by the study of near-far effects) showing the added value of a curiosity centered-(re)educational systems on spatial learning. Our participant targets are children (from 8 years old), young and old adults. The expected results is introduced in environment to produce different intensity levels of curiosity states. Property of VR application, it will lever from a preexisting prototype in which motivational objects can foster spatial learning performance. This means this new VR application will propose a set of various computer interactions that are intrinsically motivating to enhance exploration behaviors and, then to efficiency in real world context. This project is part of a team’s goal to provide children as well as older adults an efficient and unique tool for the development of space skills on a large scale (and their training in the elderly), the originality of which is to combine the assets of immersive technologies with recent scientific progress of curiosity benefits for learning in both children and older adults [5, 6].

The post-doctoral project covers the challenge to build a “human-centered digital world” with innovative interactive systems providing “adaptive and personalized interactions with humans” for supporting “their wellbeing and health.”

It will constitute a significant part to the Flowers program managed by Pierre-Yves Oudeyer on “Curiosity-driven learning and memory: from adolescence to adulthood” (E Law, Game Institute, Myra Fernandes, Cognitive neuroscience Lab), funded by the Idex program between UB and University of Waterloo on the topic of “AI and health sciences.”

How can we design (re)educational programs where individuals learn in a way that is intrinsically motivating, personalized, and at the same time achieves (re)educational objectives needed to socially participate as citizens of our world? Flowers is an interdisciplinary research group, studying mechanisms that can allow robots and humans to acquire autonomously and cumulatively repertoires of novel skills over extended periods of time. The originality of the team’s work is to focus on intrinsic motivation as an essential ingredient of learning. One of main team’s purpose is studying how curiosity state can foster to learning mechanisms.

Curiosity in all ages is a core aspect of self-goal achievement and perseverance, well-being, and quality of life. Theoretical advances on curiosity have been made in the last decade such as its formalization in the learning progress model [2, 3], in which activities that are most intrinsically motivating for individuals are self-chosen activities where empirical learning progress is maximal. Personalization is an essential challenge of (re)education, as each individual is unique and often requires different learning setup. VR-based (re)educational apps have a huge potential to address this challenge worldwide, i.e., for helping children to acquire fundamental skills like the ability to orient in space, or even for helping older adults to manage their cognitive decline for nominal independent living. It is an open-question to understand how to design VR apps that personalize both for learning efficiency and intrinsic motivation, based on cognitive science principles [3, 4].

This project is part of a team’s goal to provide children as well as older adults an efficient and unique tool for the development of space skills on a large scale (and their training in the elderly), the originality of which is to combine the assets of immersive technologies with recent scientific progress on curiosity and space exploration and learning behaviors. Leveraging from our recent results on curiosity benefits for learning in both children [3, 4] and older adults [5, 6], this new post-doctoral proposal aims at the development of an original approach joining together two perspectives: 1) the fundamental study of curiosity-driven learning across life-span (children, young adults and older adults); 2) the study of how new (re)educational technologies, using both curiosity-related models and VR techniques, can maximize curiosity and learning efficiency in real world context. We target to design a new VR application based on curiosity-related models to elicit human-computer interactions that are intrinsically motivating to enhance exploration behaviors and, then to foster spatial learning performance. This means this new VR application will propose a set of various environments (natural, urban spaces and shopping centers) that the user explores in different conditions of exploration (guided tour, free and/or arousing states of curiosity using motivational objects) and of spatial complexity (Environment size, changes of direction), and then to study visual exploration behaviors and related curiosity-related config. Regarding specifically the curiosity-related config, considering that VR application, it will lever from a preexisting prototype in which motivational objects can be introduced in environment to produce different intensity levels of curiosity states. Our participant targets are children (from 8 years old), young and old adults. The expected results is showing the added value of a curiosity centered-(re)educational systems on spatial learning irrespective of age conditions, and demonstrate the greatest resistance to time-related forgetting (long term memorization by the study of near-far effects).

Overall, the activities of post-doctoral project will be twofold:

1. To design and enrich a preexisting prototype of curiosity-based VR application that stimulates learner engagement and intrinsic motivation by eliciting states of curiosity in order to promote the required Knowledge and background:

- PhD degree or its equivalent in cognitive science or in its related-domains (e.g., Computer and human interaction, developmental psychology)
- Advanced knowledge in Unity software for designing VR based experiments
- Medium knowledge for statistics applied to human performance
- Strong interests for experimental studies with humans
- Proficiency in English for an autonomous writing of research papers

Thank you to send:
- CV
- Cover letter
- Support letters (mandatory)
- List of publication

Inria is the national institute of research dedicated to the sciences and technologies of the digital world. It employs 2600 persons. Its 200 research projects, agglomerated in general with communities of partners academic, implique plus de 3500 scientific for releve les defis du numeriue, souvent à l’interface d’autres disciplines. L’institut fait appel à de nombreux talents dans plus d’une quarantaine de métiers différents. 900 personnes d’appui à la recherche et à l’innovation contribuent à faire émerger et grandir des projets scientifiques ou entrepreneuriaux qui impactent le monde. Inria travaille avec de nombreuses entreprises et a accompagné la création de plus de 180 start-up. L’Institut values ainsi de répondre aux enjeux de la transformation numérique de la science, de la société et de l’économie.

A propos d’Inria

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development (in children) and re-training (in older adults) of the large-scale spatial skills necessary for autonomous behaviors. To this end, the tools should be configurable in terms of the proposed exploration tasks, the motivational objects included, or the complexity of the spatial learning task.

2) To study the role of states of curiosity on both user experience (with standardized questionnaires) and motivation (regarding the distinction between extrinsic, intrinsic motivation and amotivation) elicited by the VR application, but also its benefits on spatial learning according to the learner’s profile (age and higher initial skills in terms of large-scale spatial cognition) in order to ultimately establish personalized programs for the acquisition/training of large-scale spatial skills. To this end, a set of VR experiments (manipulating motivational objects, the delay between the exploration phase and the route memory test and age of participants) will be performed.

References


Avantages

- Subsidized meals
- Partial reimbursement of public transport costs
- Possibility of teleworking (after 6 months of employment) and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

Rémunération

2653€ / month (before taxes)