Direct manipulation with flexible devices

Teams: Loki (Inria Lille – Nord Europe & CRIStAL) & CIL (Carleton University)
Advisors: Thomas Pietrzak (thomas.pietrzak@univ-lille.fr), Géry Casiez (gery.casiez@univ-lille.fr) & Audrey Girouard (audrey.girouard@carleton.ca)
Funding: co-tutelle between University of Lille and Carleton University. Collaboration with Tactual Labs®.

Description


Similarly to joysticks, flexible devices pertain to the category of elastic devices. They move back to their initial position when the user releases them. Depending on their elasticity, they either behave like an isotonic (like a mouse) or isometric device (like a trackpoint). There is still a large design space to explore, with multiple combinations of form factors, combined modalities, feedbacks, and other factors to be determined.

In this thesis, the candidate will design, implement and evaluate new flexible devices and interaction techniques. He, or she, will study the relation between bending input and feedback, known as the sensory-motor loop. These are the roots of direct manipulation, which provides usability benefits. The candidate’s work will consist in:

- Studying related work on direct manipulation, flexible devices, the sensory-motor loop.
- Defining a design space for flexible devices and their interaction techniques.
- Designing software and hardware interaction techniques.

Required skills

A successful candidate must hold a MSc in computer science or equivalent, and show a great interest in performing high quality research in Human-Computer Interaction. He or she must speak and write English fluently, and experience or strong interest in software and hardware development. Creativity, independence, team working and communication skills are valuable advantages.

Working environment

The thesis will be carried out in two locations:

- The Loki team in Lille, France, joint between Inria – Lille Nord Europe and the CRIStaL (UMR CNRS 9189) laboratory of the University of Lille.
- The CIL laboratory in Ottawa, Canada, from the CSIT department of the Carleton University.

References