HaptiQ: A Haptic Device for Graph Exploration by People with Visual Disabilities

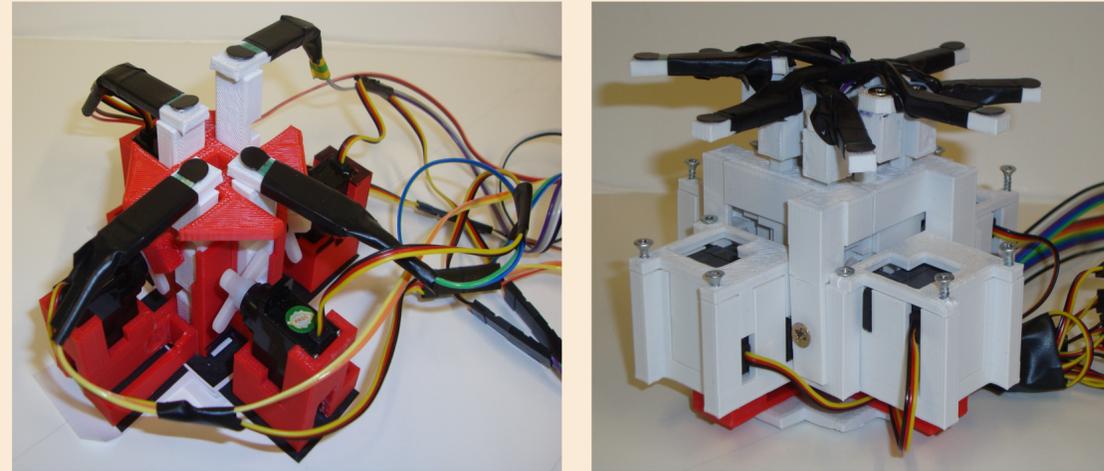Simone Ivan CONTE (*sic2@*) and Dr Miguel A. NACENTA (Supervisor)

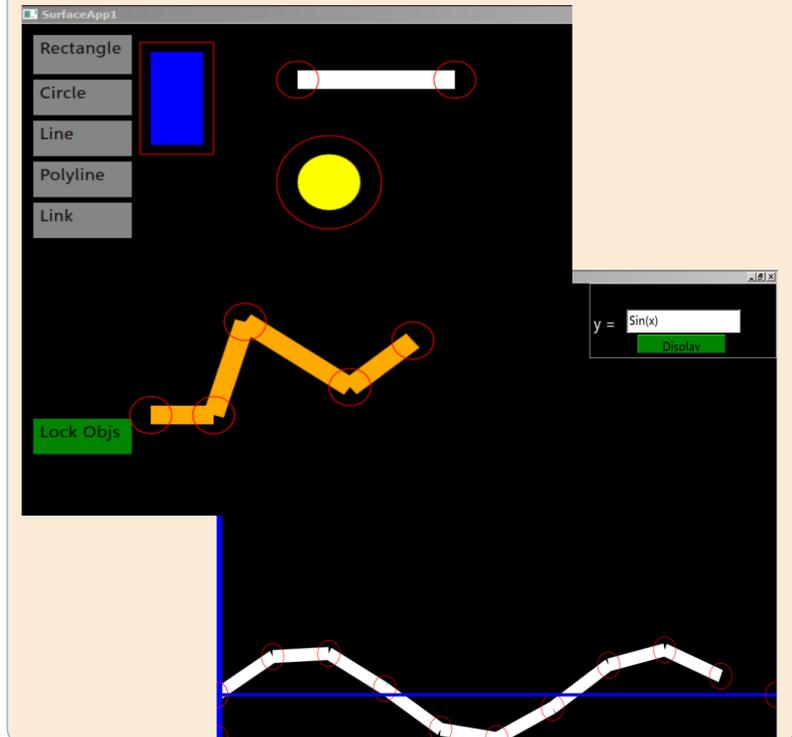University of St Andrews

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Abstract

Today's technology is not as accessible for blind and visually impaired people. Overcoming this digital divide gap is one of today's most overlooked challenges.
This project presents the first vector-based display with haptic-audio feedback for people with visual disabilities: the HaptiQ.
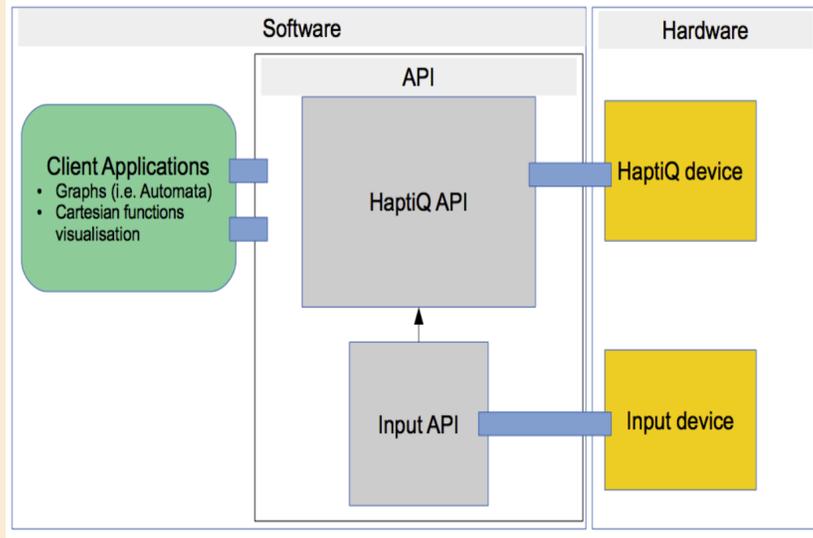
Applications

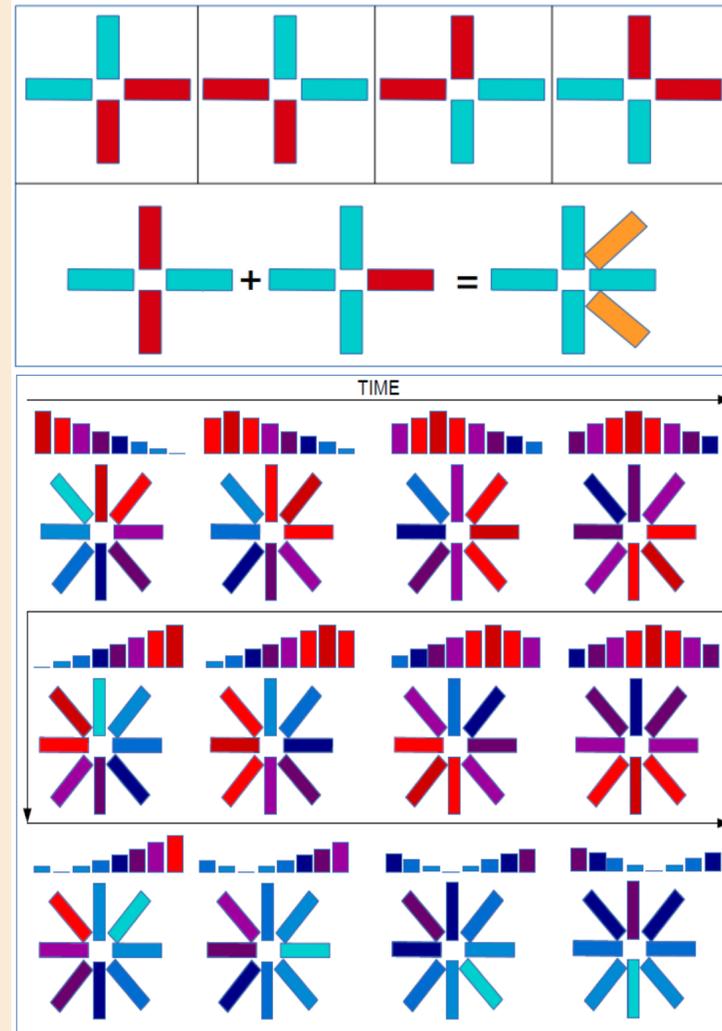- Graph Visualiser
- Function Visualiser

The API

Software | API | Hardware
Client Applications
- Graphs (i.e. Automata)
- Cartesian functions visualisation

HaptiQ API

HaptiQ device

Input API

Input device

Tactons

"Structured, abstract, tactile messages which can be used to communicate information non-visually"[1].
This work proposes a new set of dynamic tacton that are visually encoded in a way which favours the recognition of edges, corners and directions.

TIME

Conclusions and Future Work

This project presents novel approaches in the area of haptic feedback technology.
Informal observations have given positive feedback. However, a further study is already planned to empirically evaluate the HaptiQ.
In addition, a strategic game is currently developed using the HaptiQ API, in collaboration with IRIT.

Contributions

- An inexpensive haptic-audio feedback device for the visually impaired
- A device that can be 3D-printed at home
- Easy-to-use API (both low and high level)

[1] Brown, L. M., Brewster, S. A., and Purchase, H. C. A first investigation into the effectiveness of tactons. In Eurohaptics Conference, 2005 and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems, 2005. World Haptics 2005. First Joint (2005), IEEE, pp. 167-176