

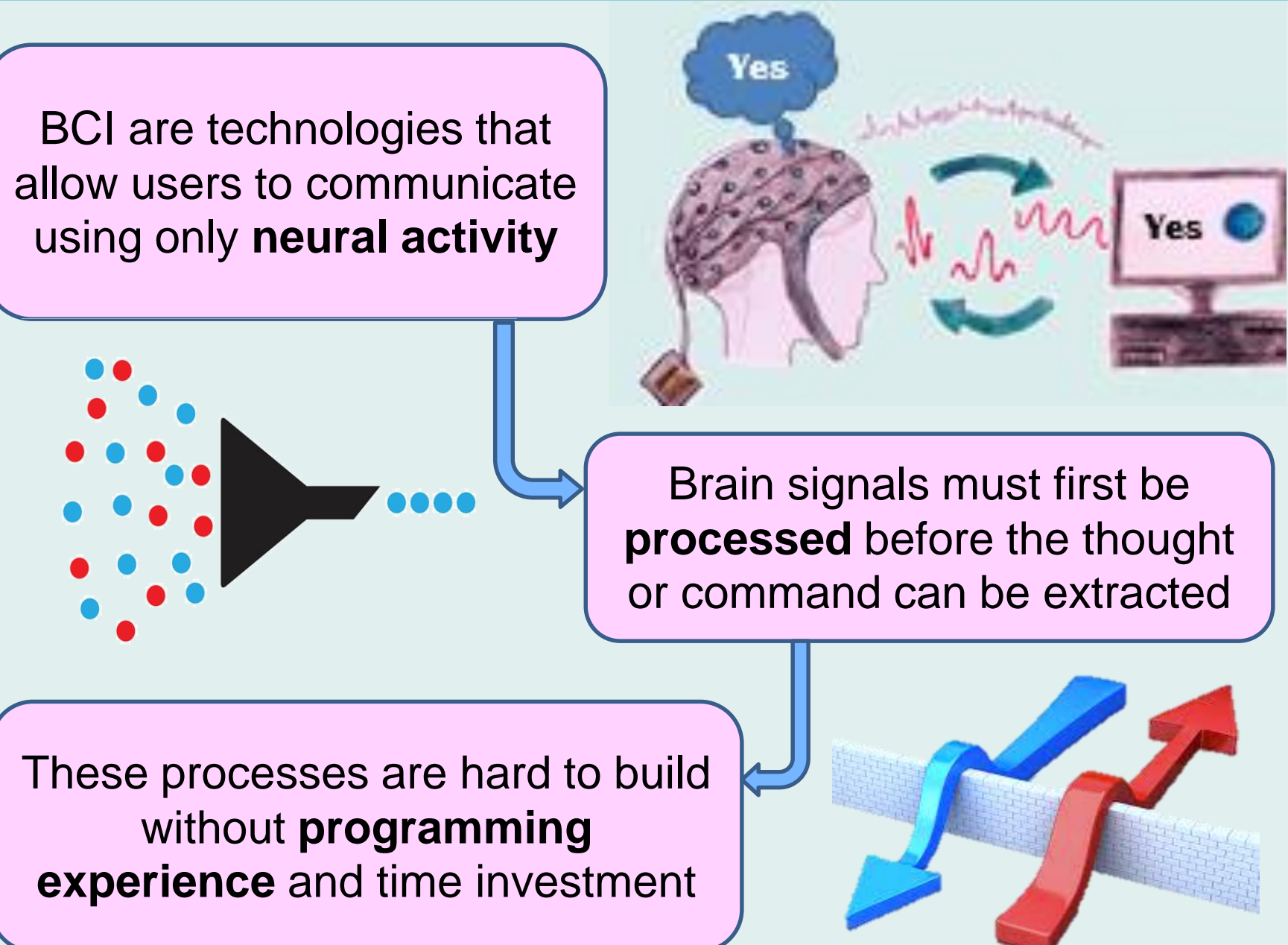
Enhancing the development of BCI processing pipelines

Aaron Lio¹, Nicolas Ivanov², Tom Chau²

¹University of Toronto, Division of Engineering Science

²University of Toronto, Institute of Biomedical Engineering

Background



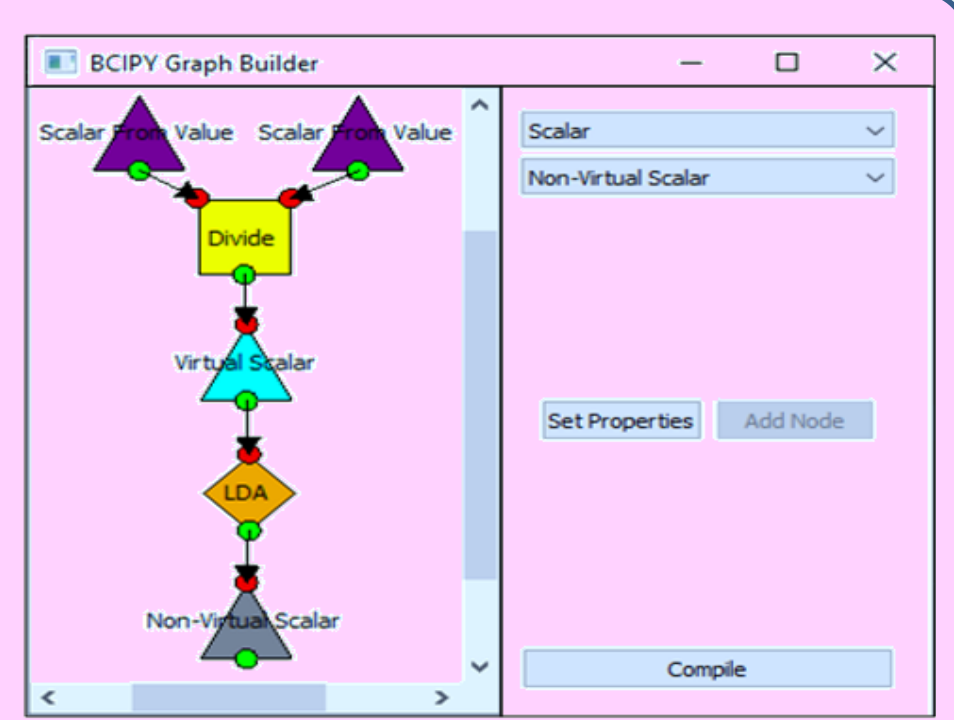
Research Question

How can a software design tool reduce technical barriers to brain-computer interface design and development?

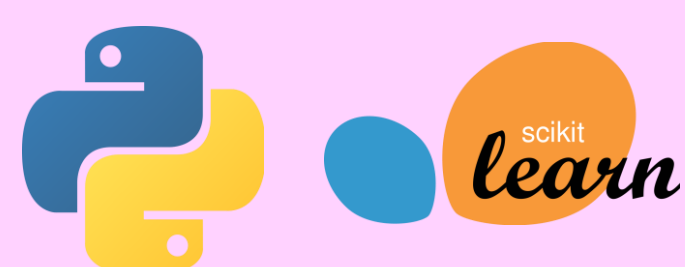


Methods

Drag-and-drop style visual interface



Software Library Backend



Easy-to-use, code-free custom pipeline creator

A software tool to reduce technical barriers to Brain Computer Interface (BCI) development

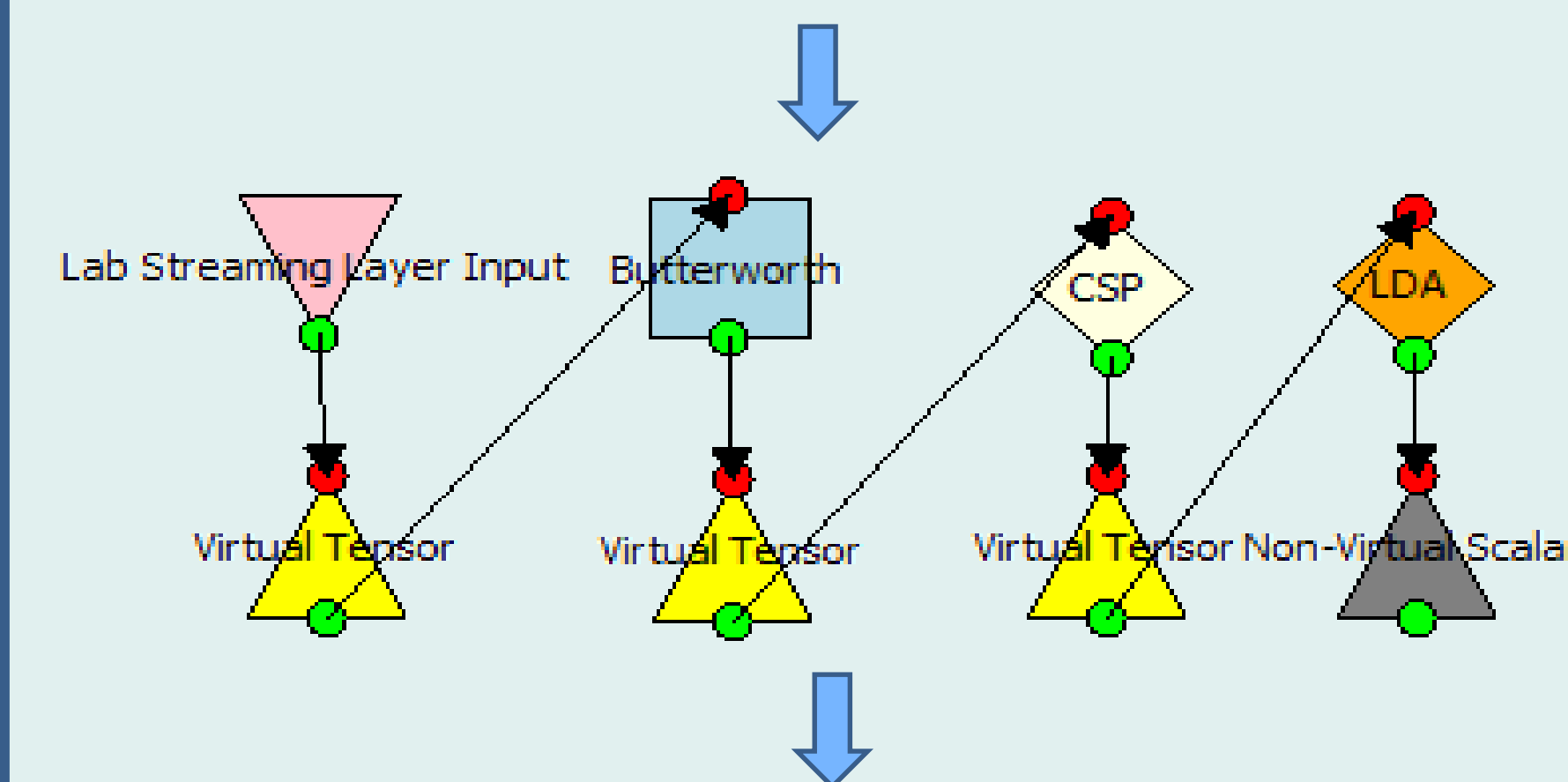


Results

Building a Standard Processing Pipeline:

Method	Number of lines of code
MATLAB	~300
Python Backend	-50
Visual Interface	0

Standard Processing Pipeline built with the tool



Minimizes programming knowledge needed to design a processing pipeline

Conclusion/Next Steps

By enhancing the BCI development process, the tool:

Expands BCI Clinical Usability

Provides pediatric clients with neuromuscular challenges alternative communication options

Encourages engagement in BCI research from individuals without programming knowledge

In the future, built-in simulations for further experimental capability will be developed.



Acknowledgements



Holland Bloorview staff and students
Ward Family
PRISM Lab Members

Holland Bloorview
Kids Rehabilitation Hospital



Division of Engineering Science
UNIVERSITY OF TORONTO