DUPLO: A programming language for two-armed robots.

David Shepherd (VCU), Felipe Fronchetti (VCU), Kiera O'Flynn (VCU), Nico Ristchel (UBC) and Reid Holmes (UBC).

https://vcuse.github.io/duplo/

Due to the lack of support for parallel programming in collaborative robots, novices often face difficulties when attempting to program robots with multiple arms. Such a problem reduces the accessibility to collaborative robots, concentrating the development of these machines in the hands of a few engineers.

Companies such as Franka Emika and Universal Robots are working on the universalization of collaborative robots, constantly designing programming environments that are made to be easy and simple to use. However, the problem with the solutions presented by these companies is that none of them comprehend end-users and two-armed robots.

To overcome the complexity of programming multiple arms, we propose DUPLO, a block-based programming language designed for two-armed robots:
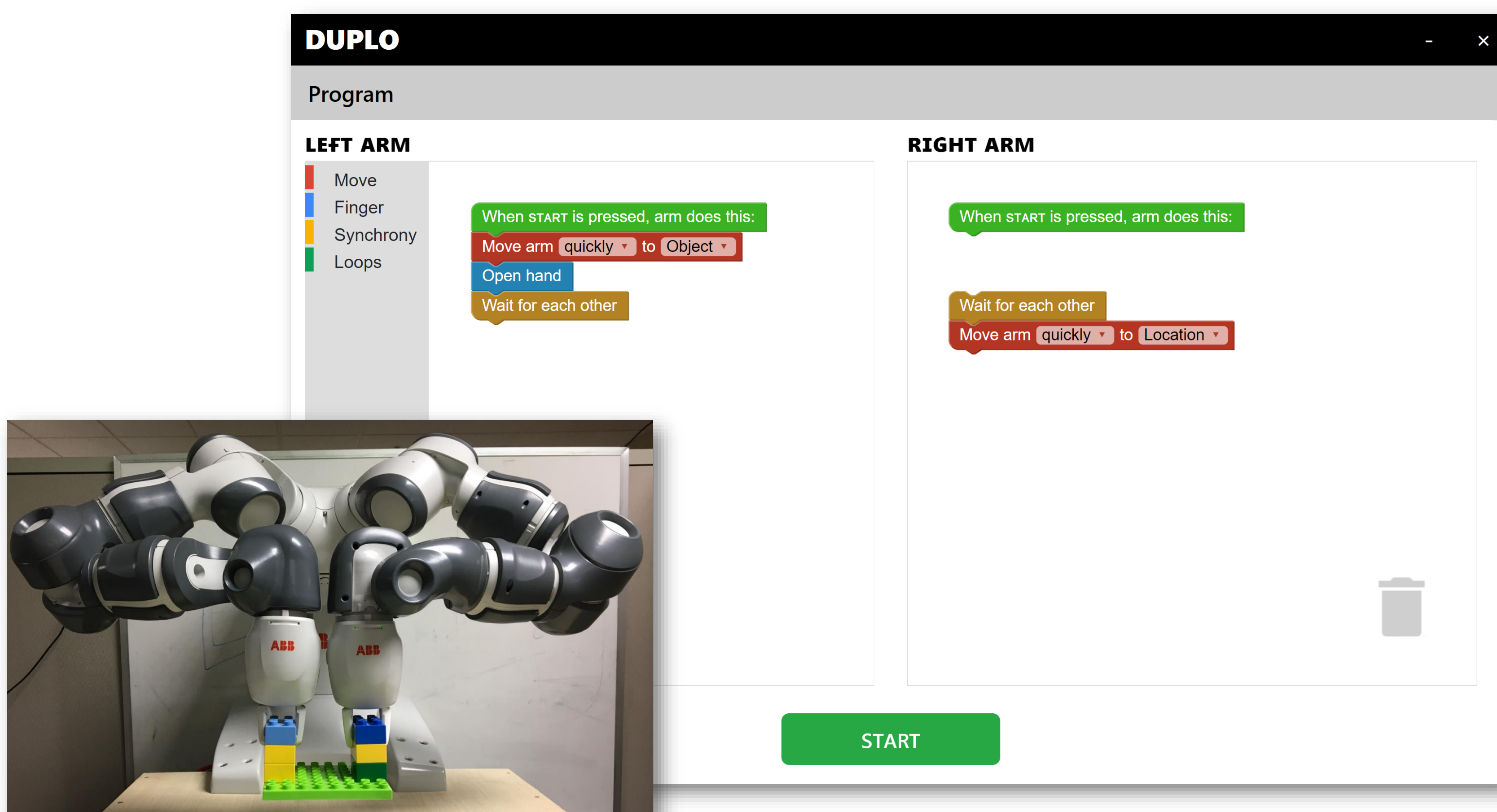

Based on a study with more than 270 professionals[1], DUPLO is made to be simple and intuitive, following the principles of universal design. Its development is being made in partnership with a manufacturing center near Richmond, and the language will be tested soon with students of a community college near the city.

With the introduction of this language, we expect to impact:
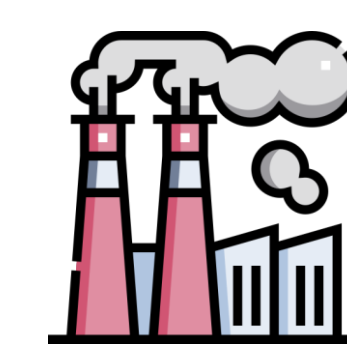
Industry: Better programming environments result more professionals working on production lines, improving the automation process of industries.
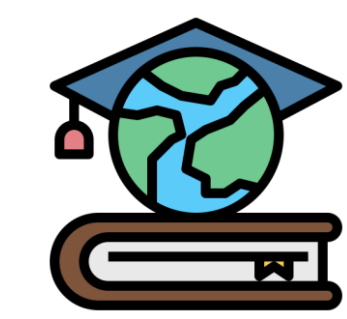
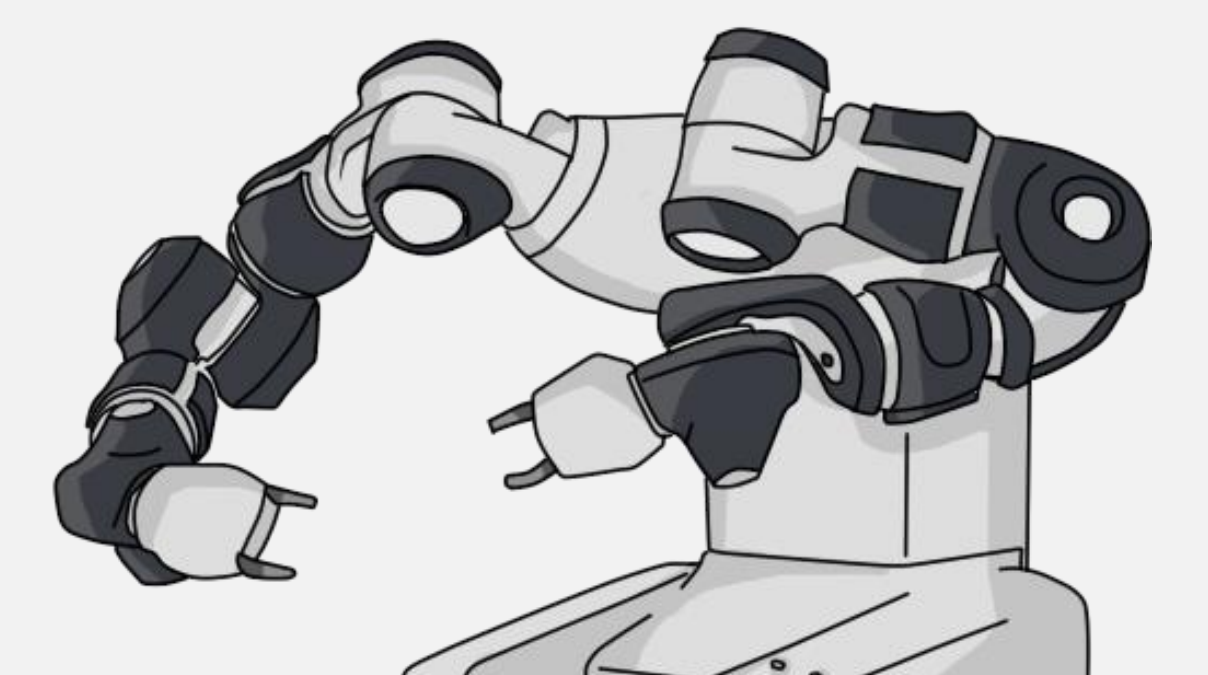**Education:** Accessible languages open spaces for more professionals in the automation industry.

Society: With more robots working on production lines, problems related to manual labor are reduced.

We're open source!
Visit our project on GitHub:
https://github.com/vcuse/duplo

[1] Ritschel, Nico, et al. "Comparing Block-based Programming Models for Two-armed Robots." *IEEE Transactions on Software Engineering* (2020).