Self-Assembling Modular Robots Enabled by an Articulated Multi-Axis Connector

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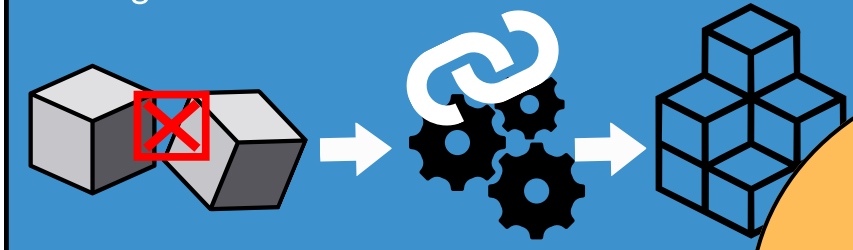
Engineering Problem:

Autonomous modular robots require connector mechanisms tolerating positional and angular misalignment.

Engineering Goal:

Design and evaluate novel connector mechanisms that facilitates reliable autonomous self-assembly.



Better Connectors Facilitate Robot Assembly

Data

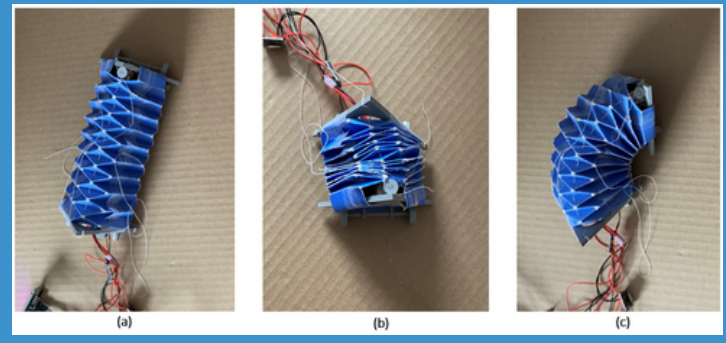
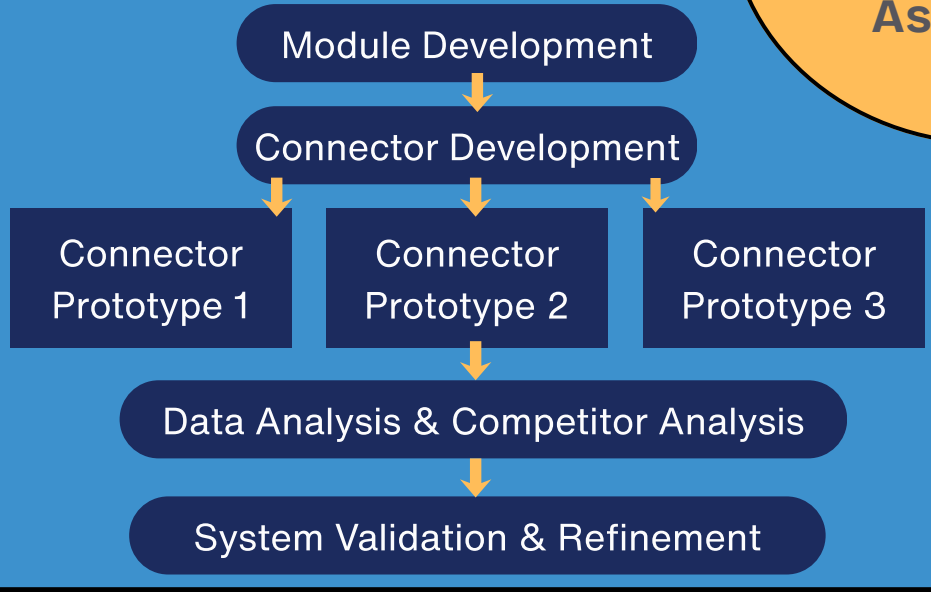


Figure 1: (a) The module has a length of 170 mm when it is fully extended, (b) The fully compressed module has a length of 61 mm when it is fully compressed, (c) The maximum bending angle of the module is approximately 110 degrees. The maximum speed of the robot is about 10 cm/s.

Methodology



Discussion

- A functional robotic module has been successfully developed.
- Three distinct connector mechanisms have been prototyped to explore different approaches to reliable modular attachment.
- Preliminary testing yields practical insights to alignment tolerance and further design refinement is necessary.