

Learning to Guide and to Be Guided in the Architect-Builder Problem

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Paul Barde (Mila) and Tristan Karch (Inria)

Derek Nowrouzezahrai, Clément Moulin-Frier, Christopher Pal and Pierre-Yves Oudeyer



Motivations



Example of a parent teaching an infant to stack cubes

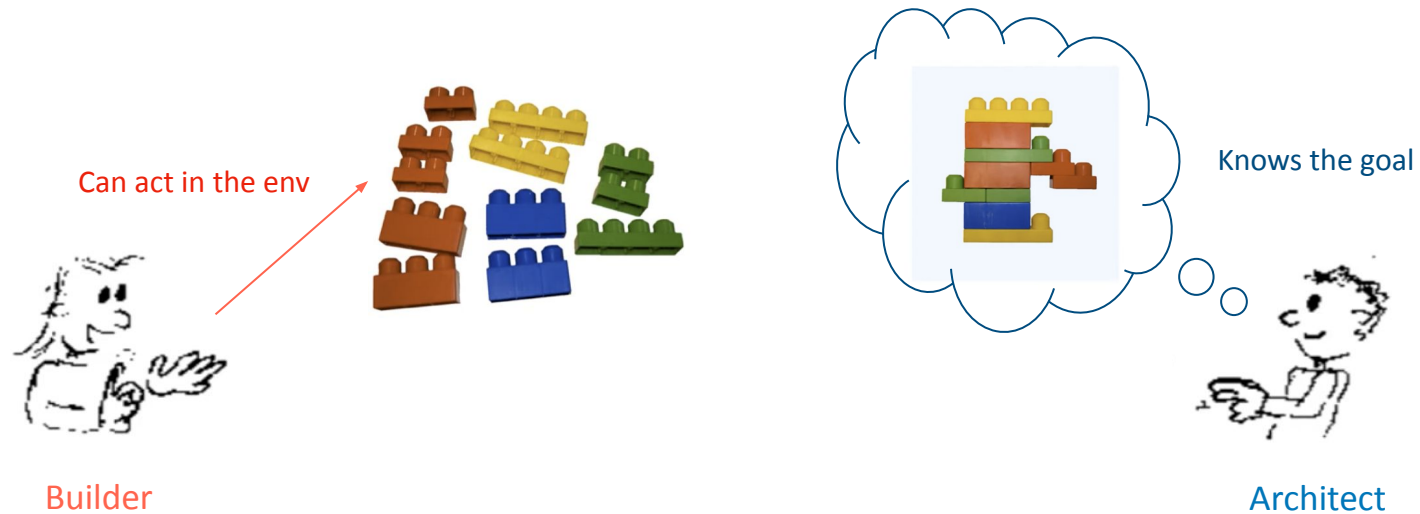
Teaching/Learning with **no shared language** and **very little common ground**.

Experimental Semiotics aims at investigating in the laboratory the development of novel forms of human communication.

Motivations

The Co-Construction experiment (Vollmer et al. 2014) aims at studying the underlying mechanisms required for the emergence of communications between two humans.

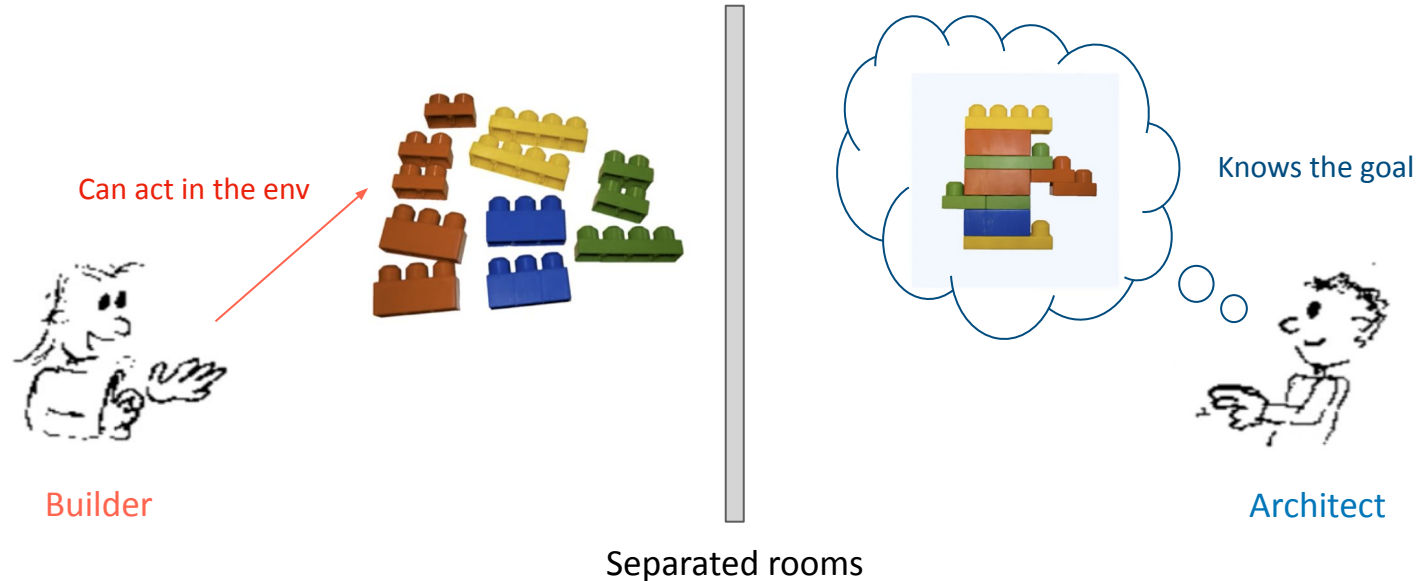
Co-construction is an experiment with two humans that have **asymmetric roles** -> **collaboration is required**



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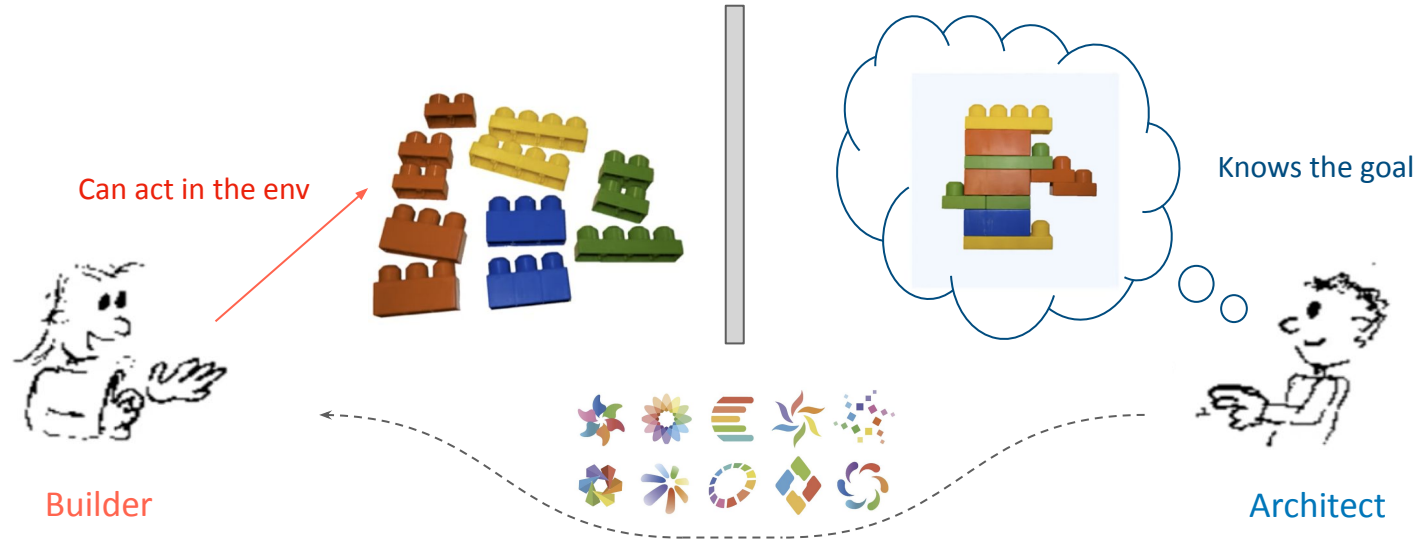
Co-construction is an experiment with **restricted communication**



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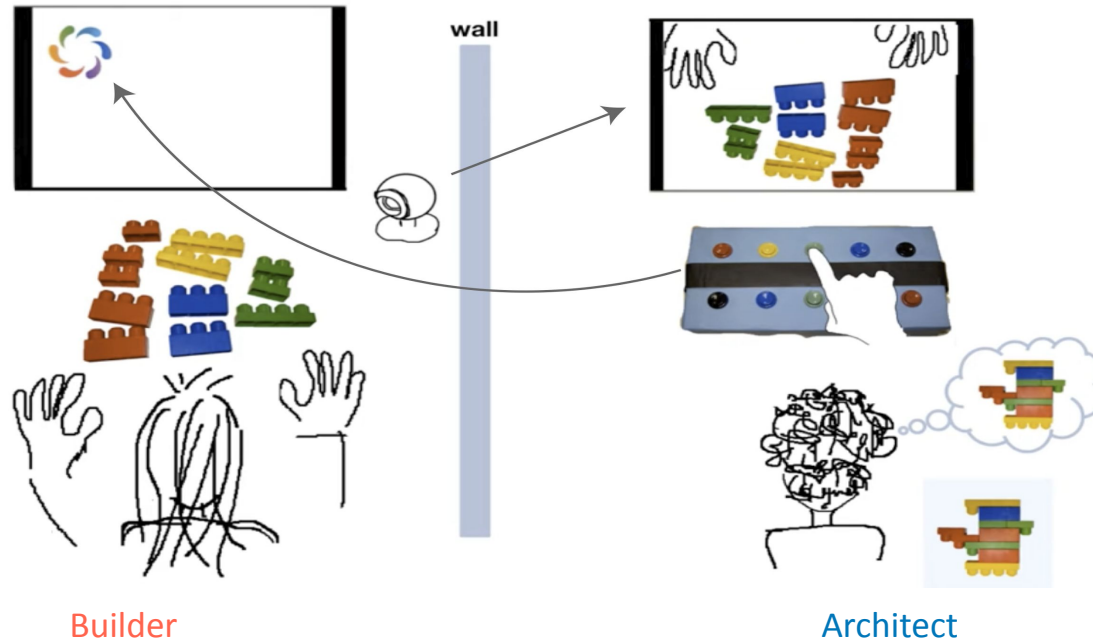
Co-construction is an experiment with **restricted communication**



Messages are neutral signals that
have no apriori meanings

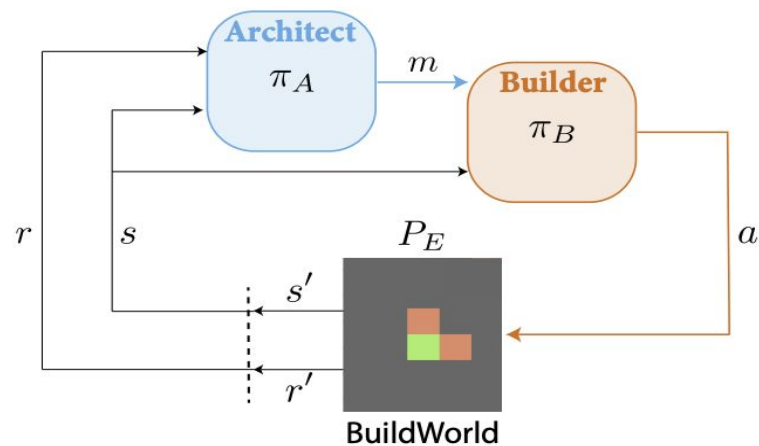
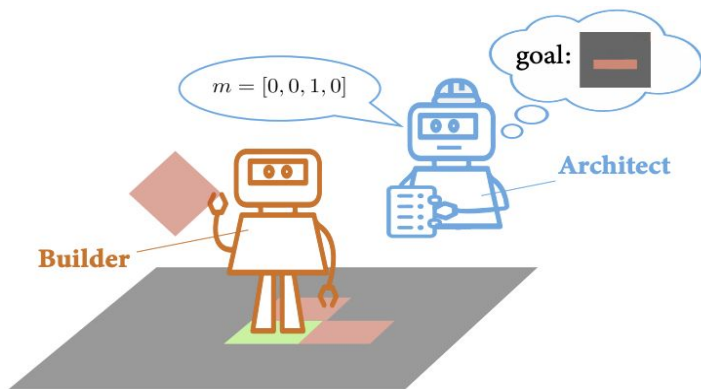
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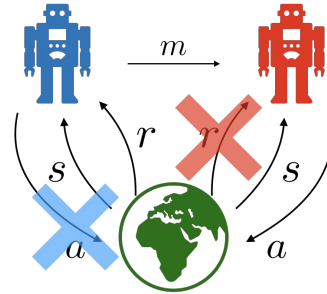
The Architect Builder Problem (ABP)

An new asymmetrical interactive learning setting



Why the ABP is an interesting problem

- 1) A new paradigm with new assumptions in multi agent learning.



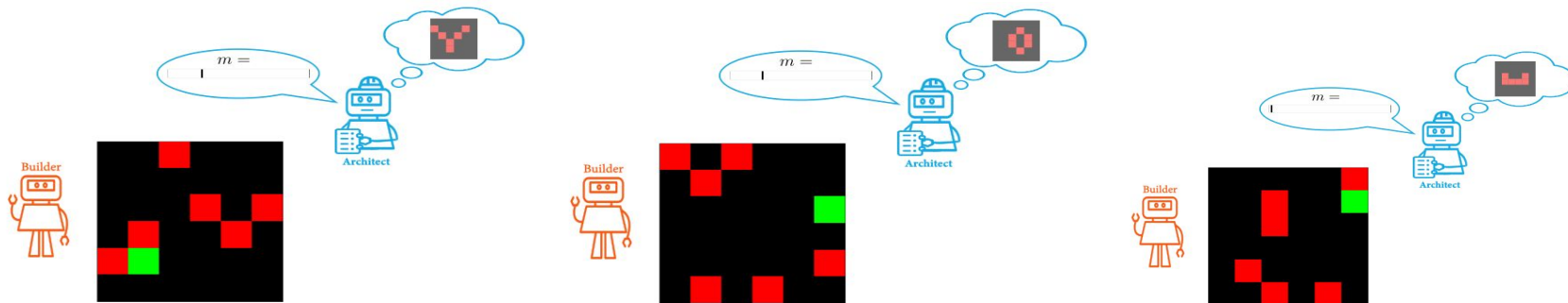
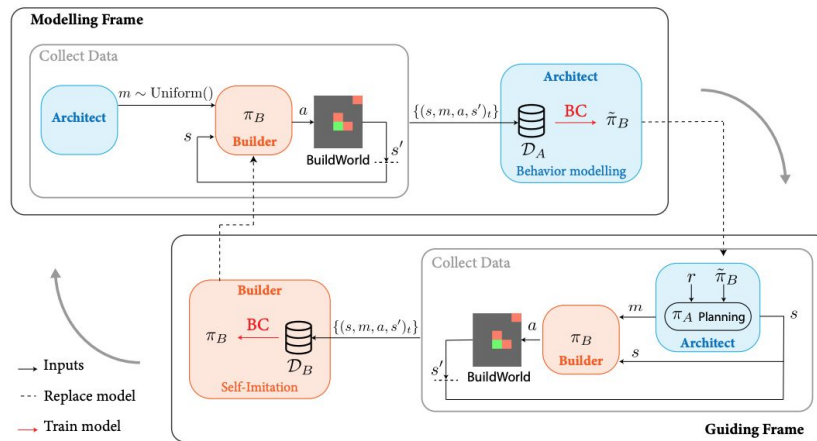
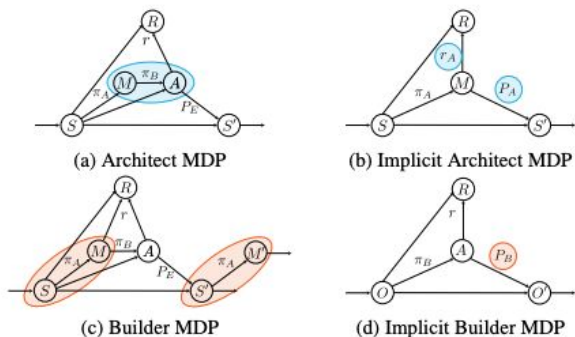
- 2) Real world applications with similar assumptions → Brain Computer Interface (BCI)

In BCI, it is hard to define a reward function for the system.
Brain signals = Architect / Robotic arm = Builder
Simultaneously learning the protocol and the task
is equivalent to **doing online calibration of BCIs**



Solution and Results

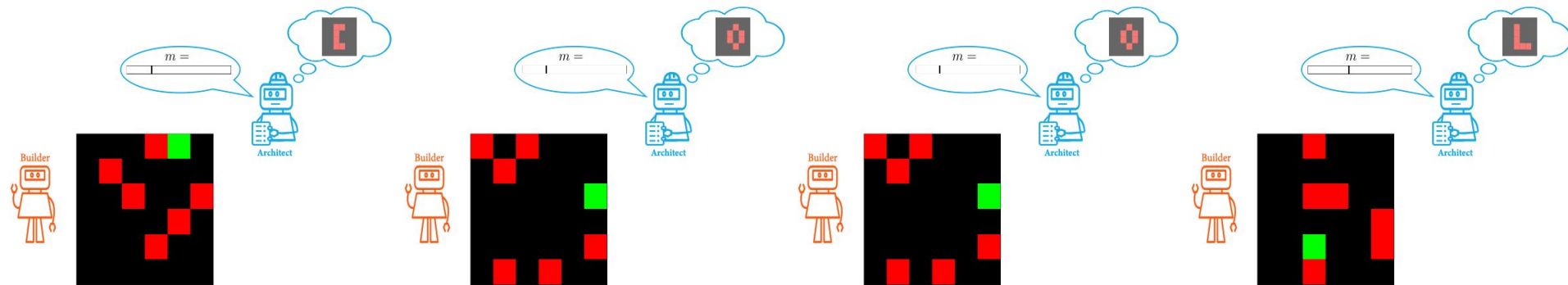
ABIG: Architect-Builder Iterated Guiding



Thank you!

Any questions ?

[Link to paper](#)



References

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