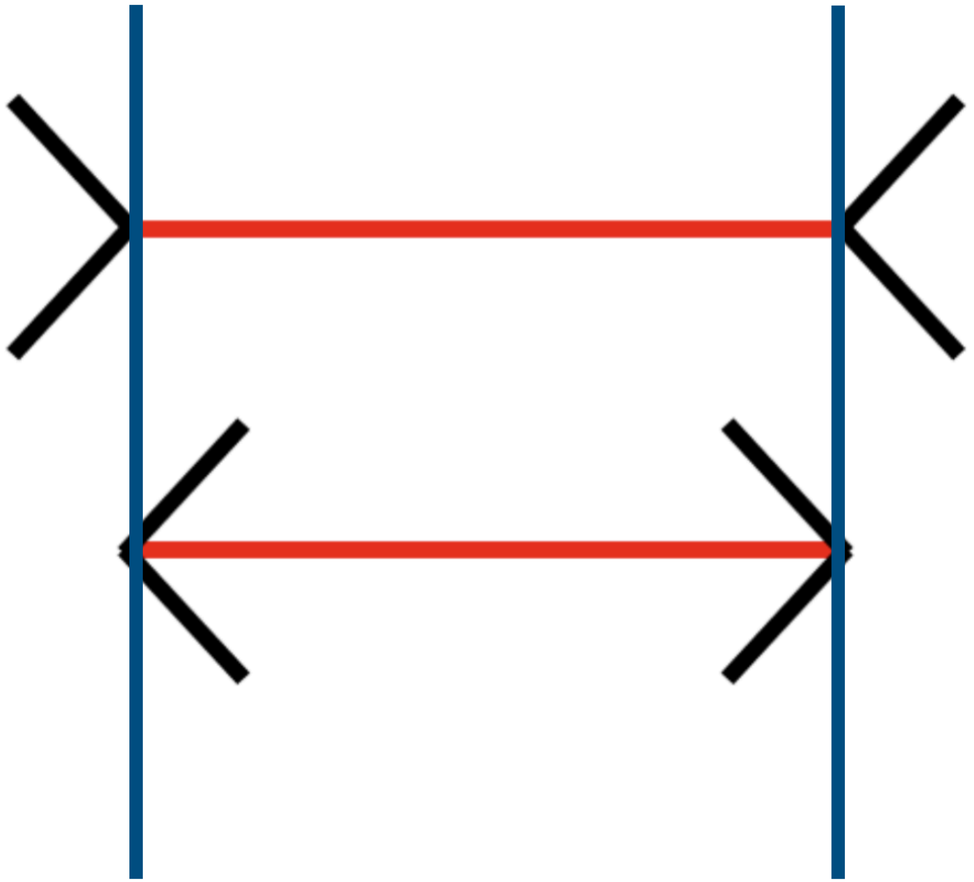
The Müller-Lyer Illusion

In *Natural* and *Artificial* Intelligence

Alish Dipani, *CoCo Fellow*

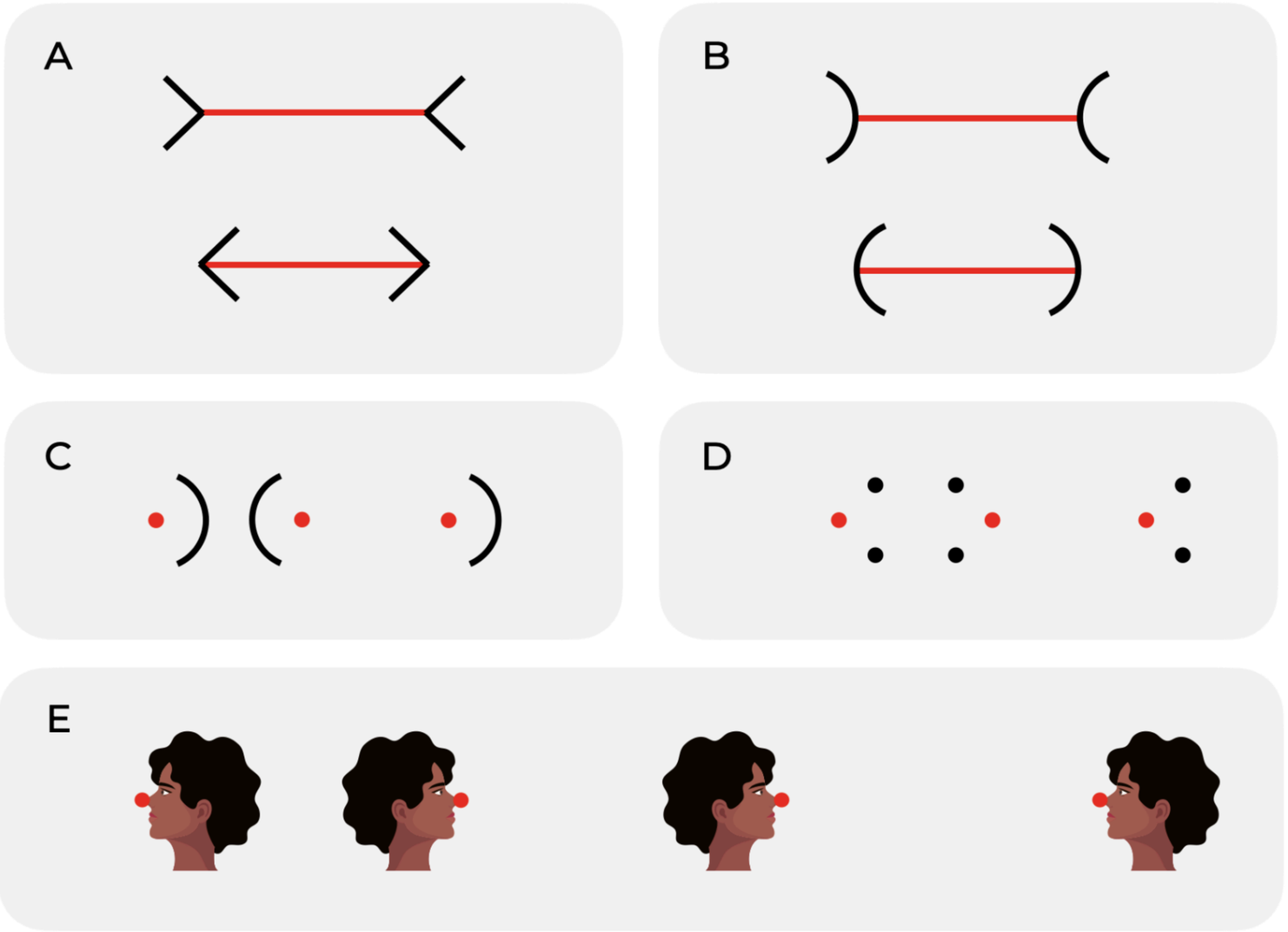
The Müller-Lyer Illusion



(Müller-Lyer, 1889)

The Müller-Lyer Illusion

Variants

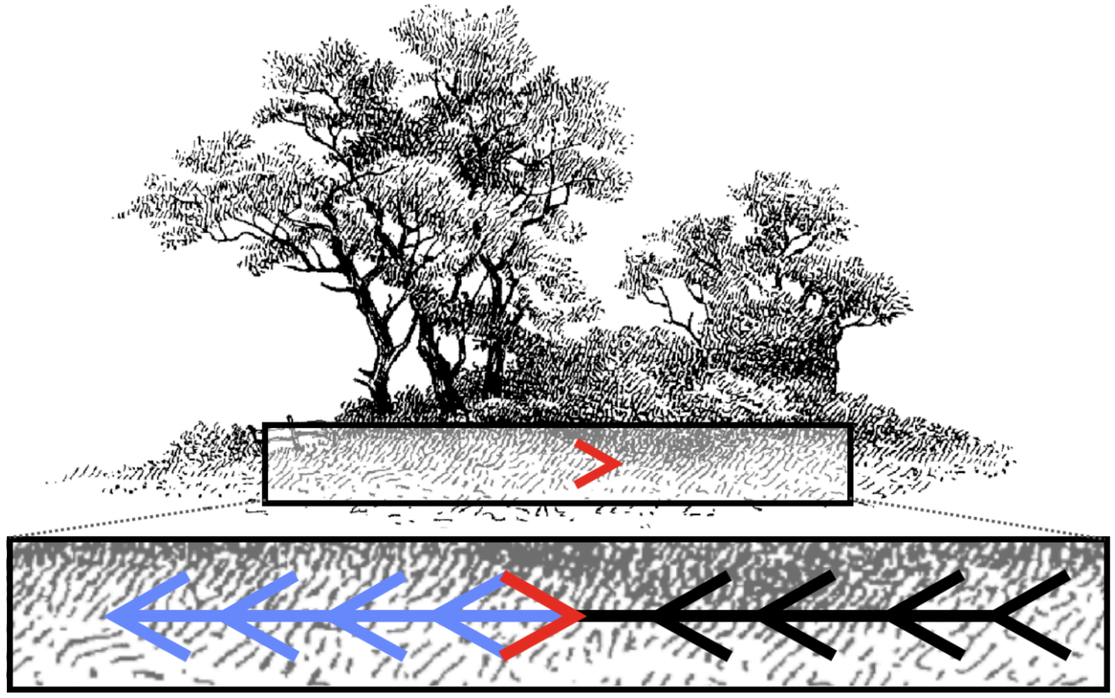


(Amir & Firestone, 2025)

The Müller-Lyer Illusion

Limited to western cultures?

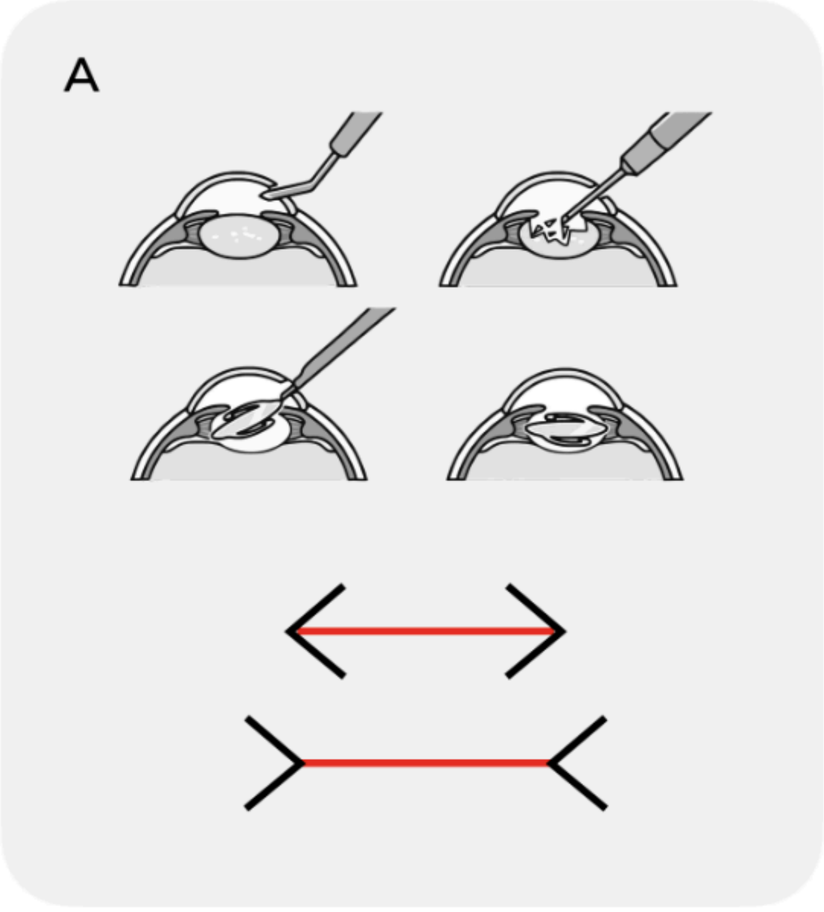
(Gregory, 1968)
(Segall et al., 1963)

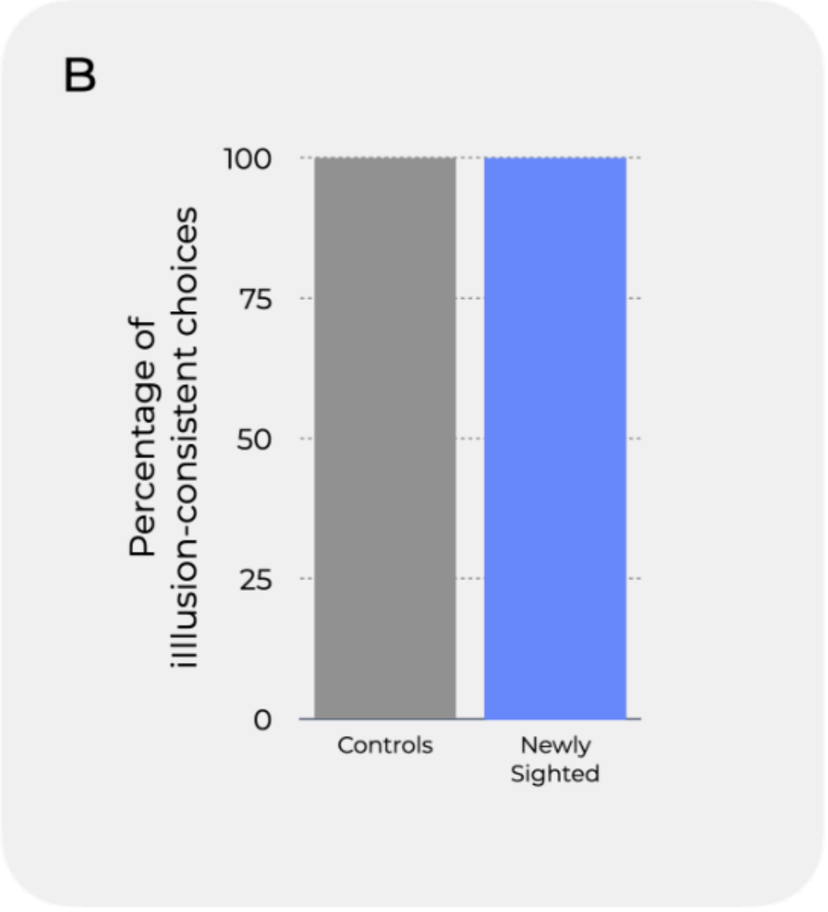


(Howe & Purves, 2005b)

The Müller-Lyer Illusion

Limited to typically developed individuals?



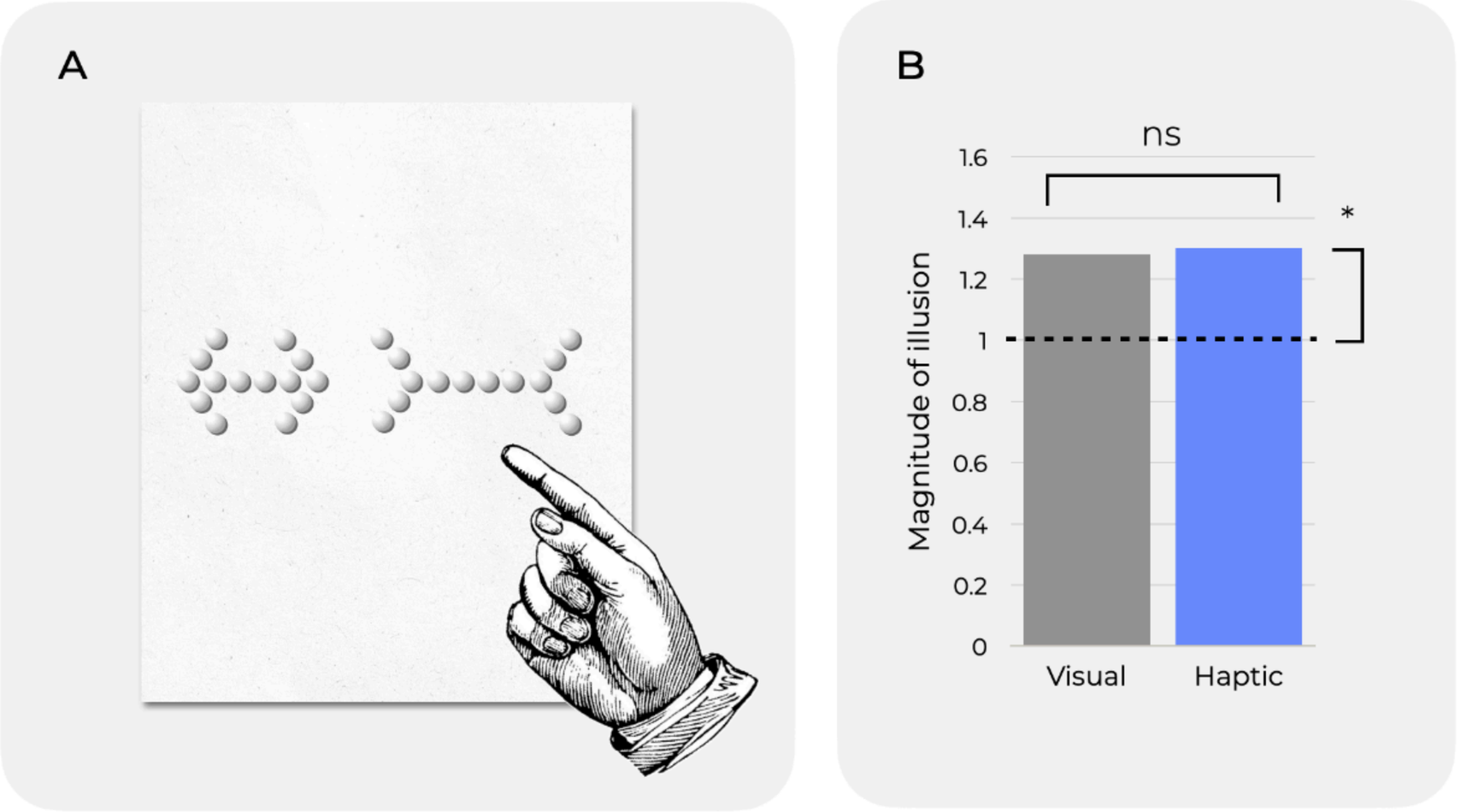


PROJECT PRAKASH

(Gandhi et al., 2015)

The Müller-Lyer Illusion

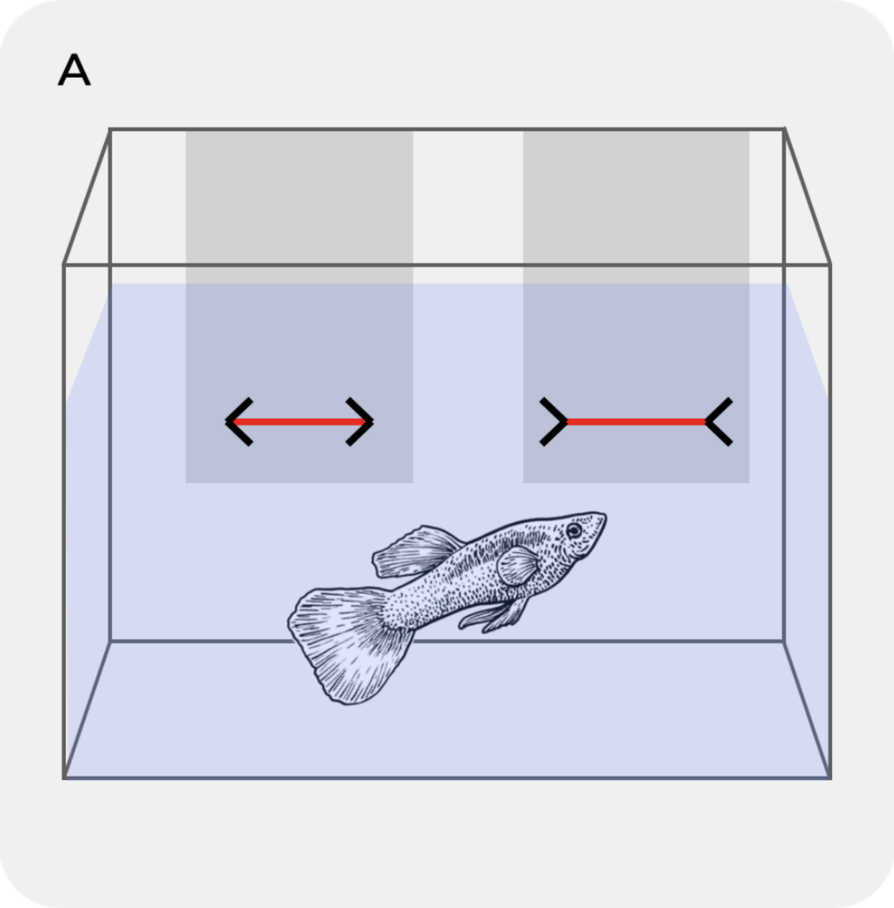
Limited to vision?



(Suzuki & Arashida, 1992)

The Müller-Lyer Illusion

Limited to humans?



Parakeets
(Watanabe, 2022)

Horses
(Cappellato et al., 2020)

Pigeons
(Nakamura et al., 2006)

Lizards
(Santacà et al., 2020)

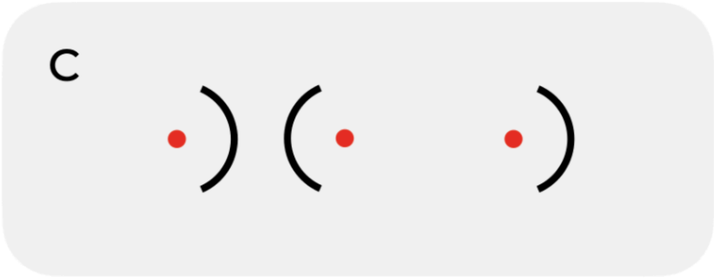
Ants
(Sakiyama & Gunji, 2013)

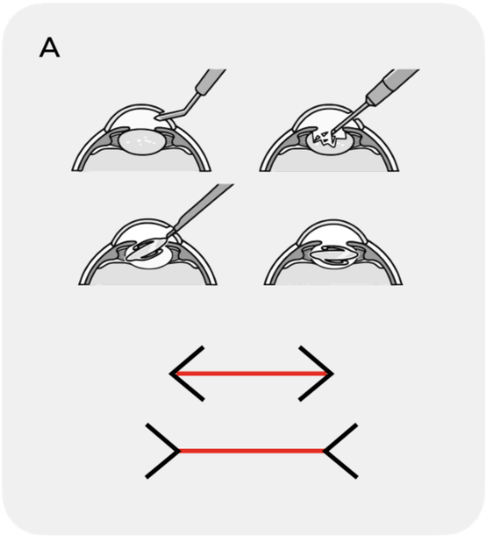
(Santacà & Agrillo, 2020a)

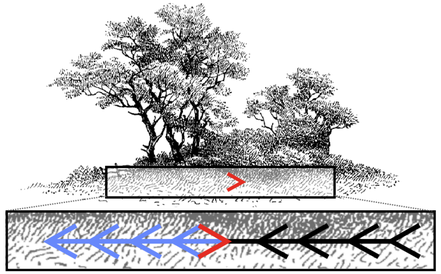
The Müller-Lyer Illusion

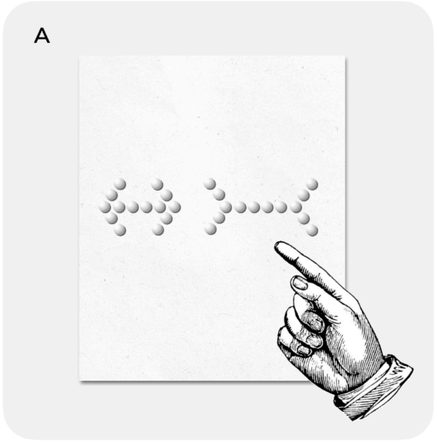
Summary

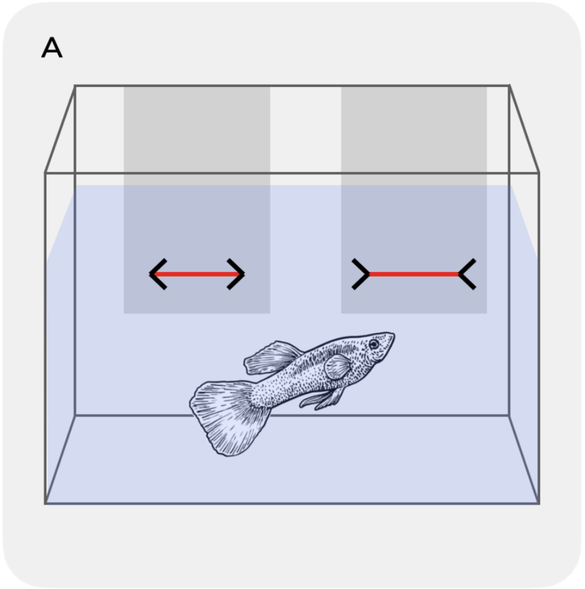
- *Not limited to straight lines*
- *Not limited to western cultures*
- *Not limited vision*
- *Not limited to humans*





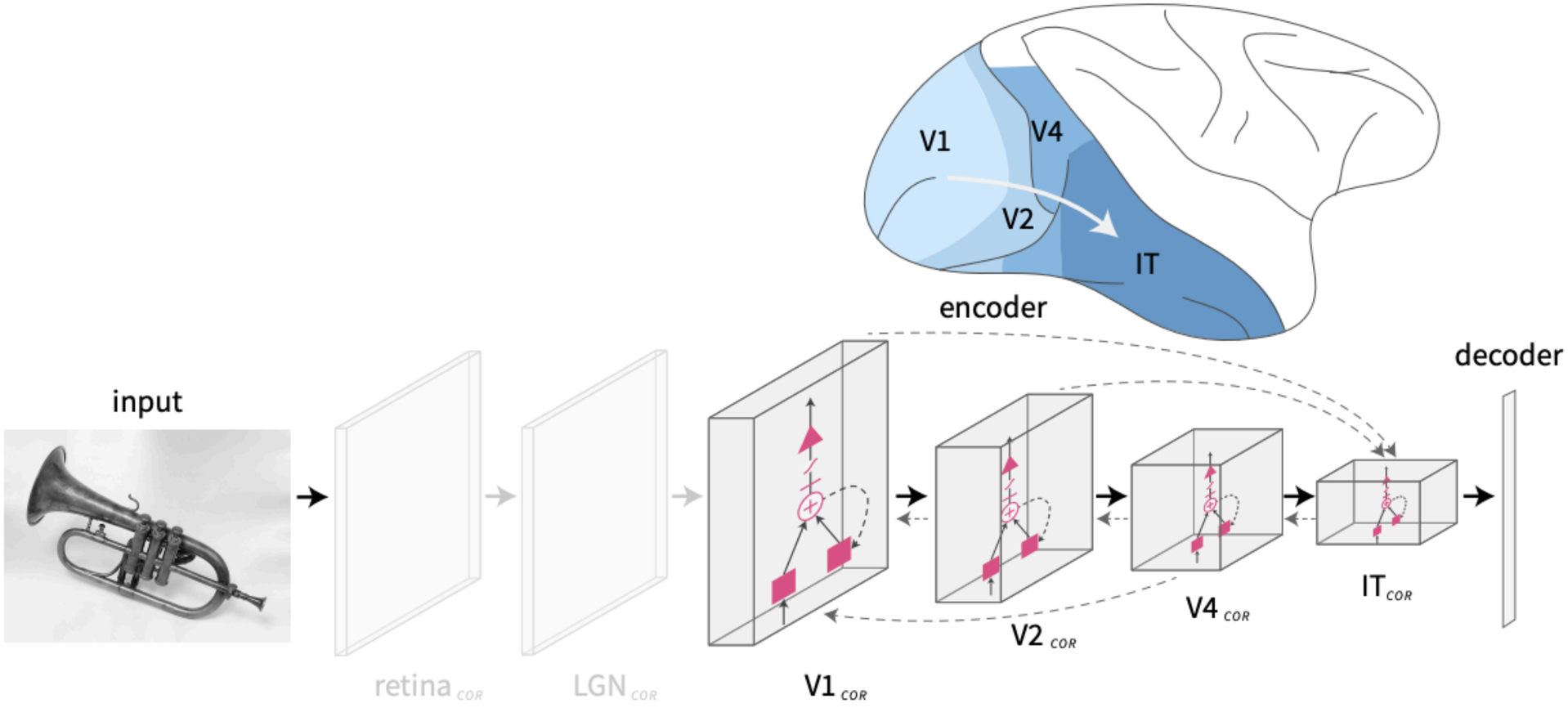






Machines

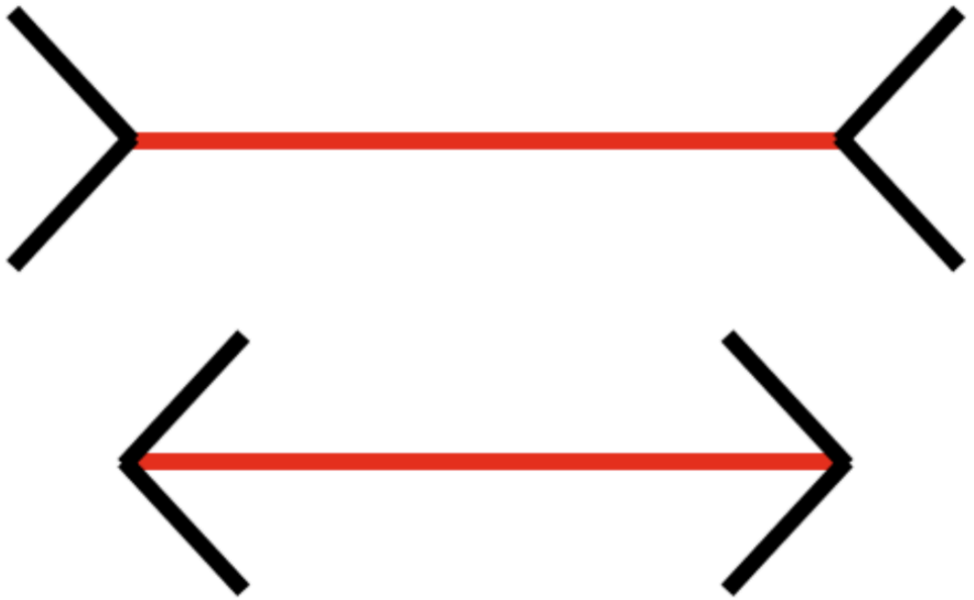
Deep Neural Networks as the model of the brain



(Kriegeskorte, 2015)

Machines

Do DNNs perceive the Müller-Lyer Illusion?



(Müller-Lyer, 1889)

Demo

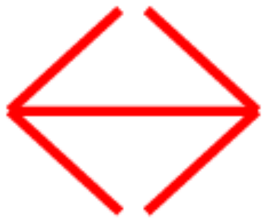
Does ChatGPT perceive the Müller-Lyer Illusion?

Which is longer, the blue line or the red line?

***Try it yourself**: https://github.com/alishdipani/psyc1101_coco_demo*

Machines

But do machines *really* perceive the Müller-Lyer Illusion?



(Ullman, 2024)

Demo

But does ChatGPT *really* perceive the Müller-Lyer Illusion?

Which is longer, the blue line or the red line?

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Machines

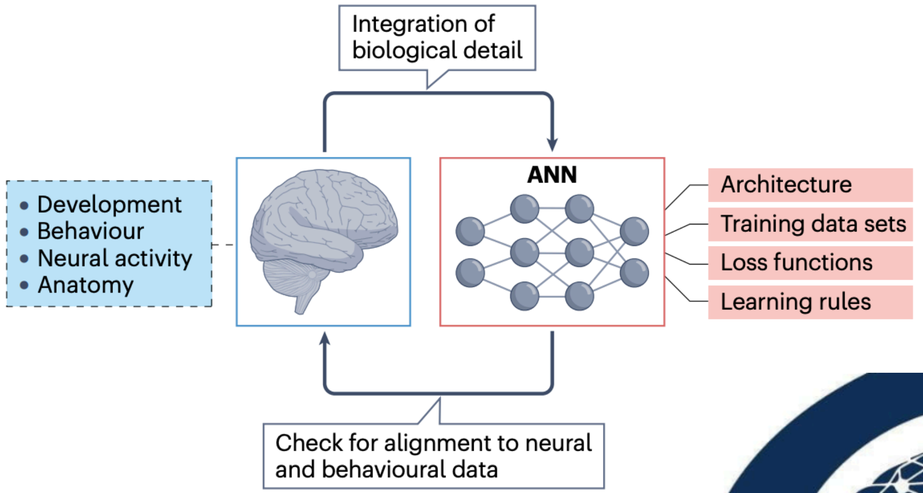
Summary

- *DNNs may appear to perceive the illusion*
- *However, they also perceive the illusion when it's not present (*Illusion *Illusion)*

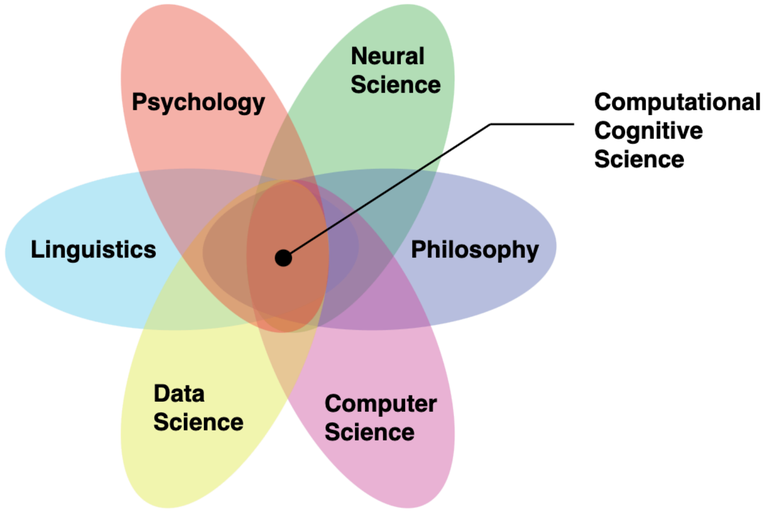
(Ullman, 2024)

The Future

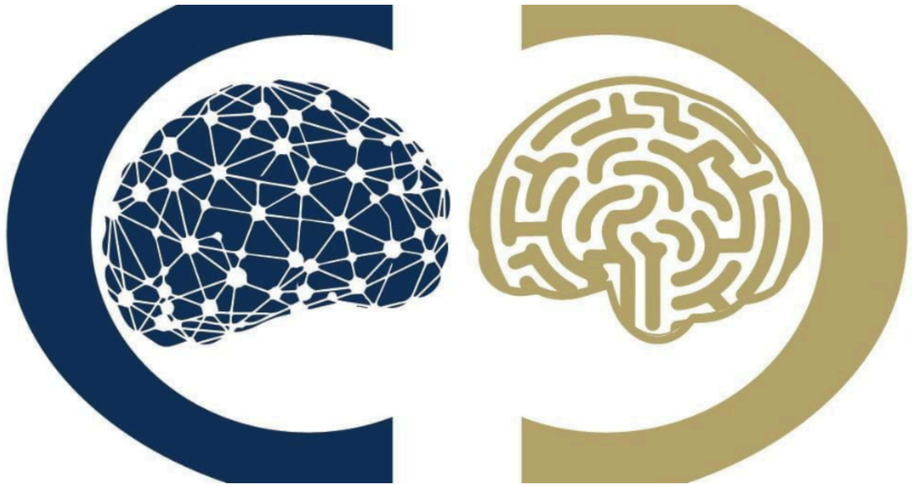
Computational Cognitive Science or NeuroAI



(Doerig et al., 2023)



(https://gureckislab.org/cogsci.html#/)



The Center of Excellence in Computational Cognition

(CoCo)

(Zandor et al., 2023)

(Neuromatch NeuroAI course)

Thank you!

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Try it yourself*: https://github.com/alishdipani/psyc1101_coco_demo*