

Residual biological motion perception in a case of cortical blindness

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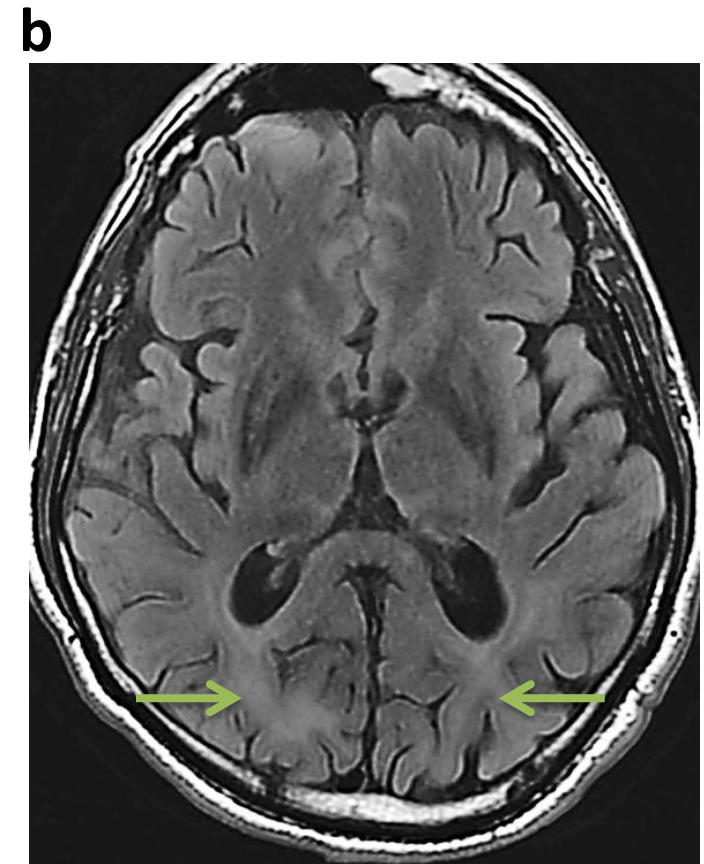
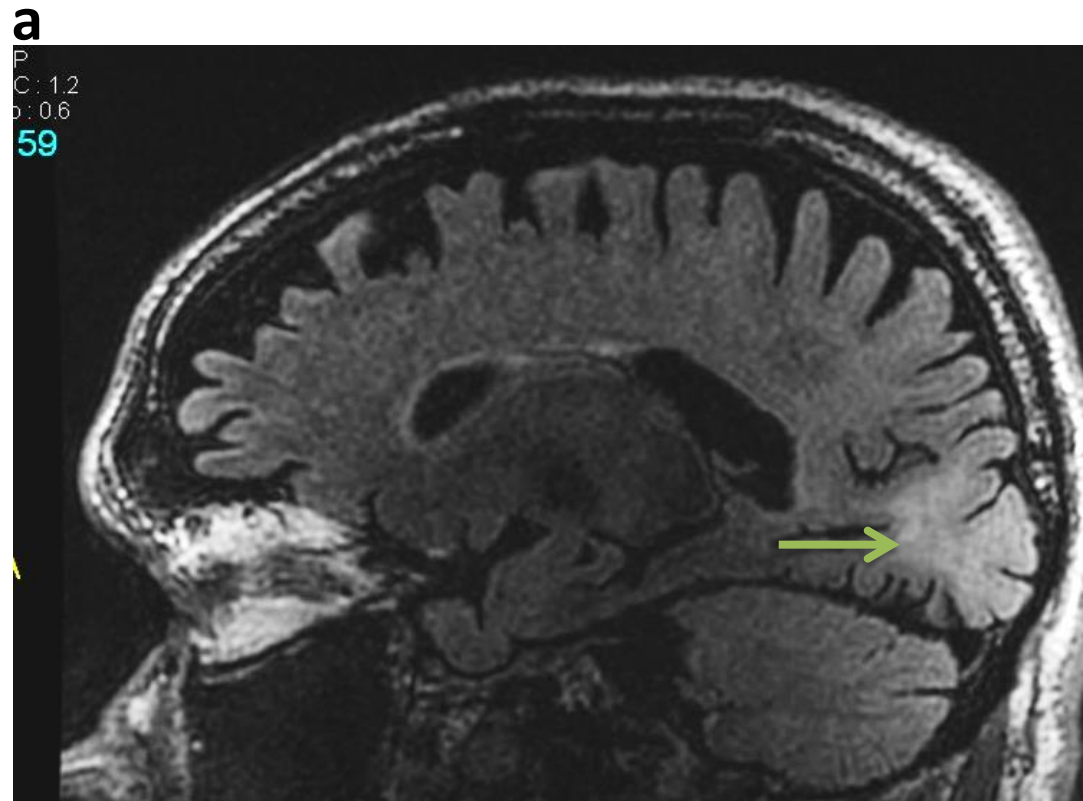
Cognition Day 2014
Fribourg University



BC

- 59 years old patient, right-handed, financial director (university degree), married, 4 children
- Suffered from a heart attack in 2010
- Severe post-anoxic encephalopathy

Standard MRI, 4 months after heart attack



- moderate cortical atrophy
- bilateral posterior white matter hyperintensity in regard to both striate area (green arrows)


BC

- Amnesic syndrome, apraxia, anosognosia
- Normal ophthalmological examination
- Cortical blindness
 - Does not recognize shapes, letters, faces, objects, colors
 - Totally dependent for activities of daily living

Patient wearing eye-tracking glasses, in his apartment

- 4 years after heart attack



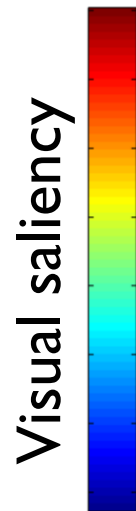


Patient wearing eye-
tracking glasses, in his
apartment

BC: Clinical evolution

- Slow recovery of :
 - Low-level visual saliency processing

Saliency



→ **Oculomotor responses towards visual saliency**

BC: Clinical evolution

- Slow recovery of :
 - Low-level visual saliency processing
 - Motion processing

Motion processing

- Video 6 months post heart attack



Please sit down on this chair

Motion processing

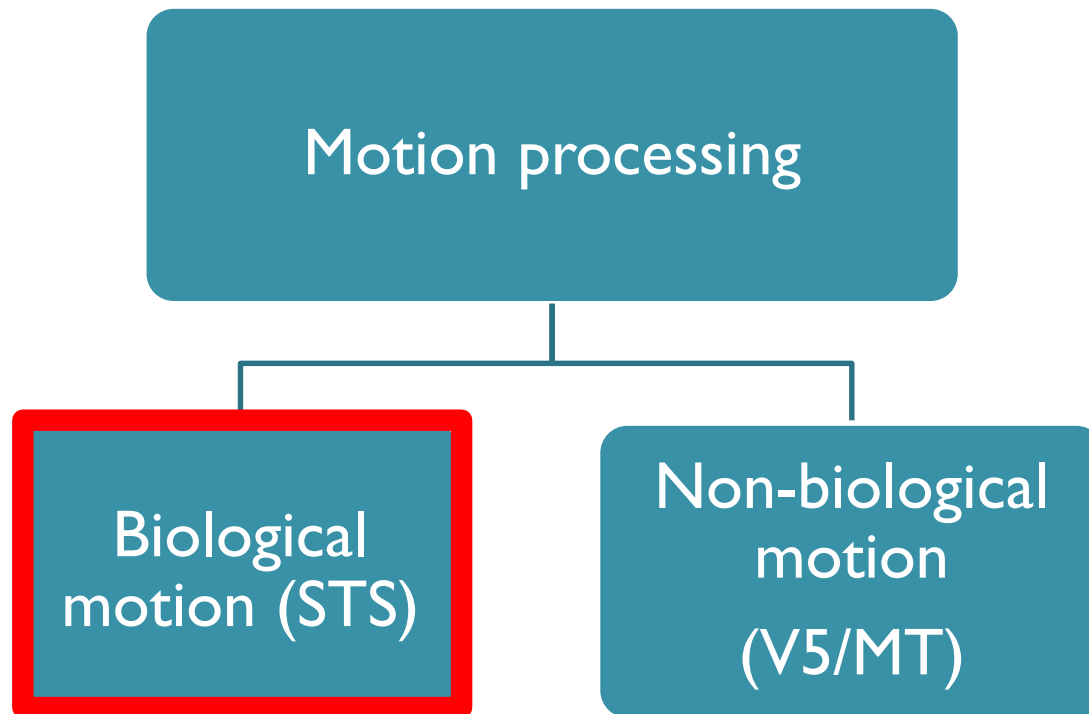
- Conservation of motion processing
➔ Rehabilitation: could it help object recognition?

Motion does not improve object recognition

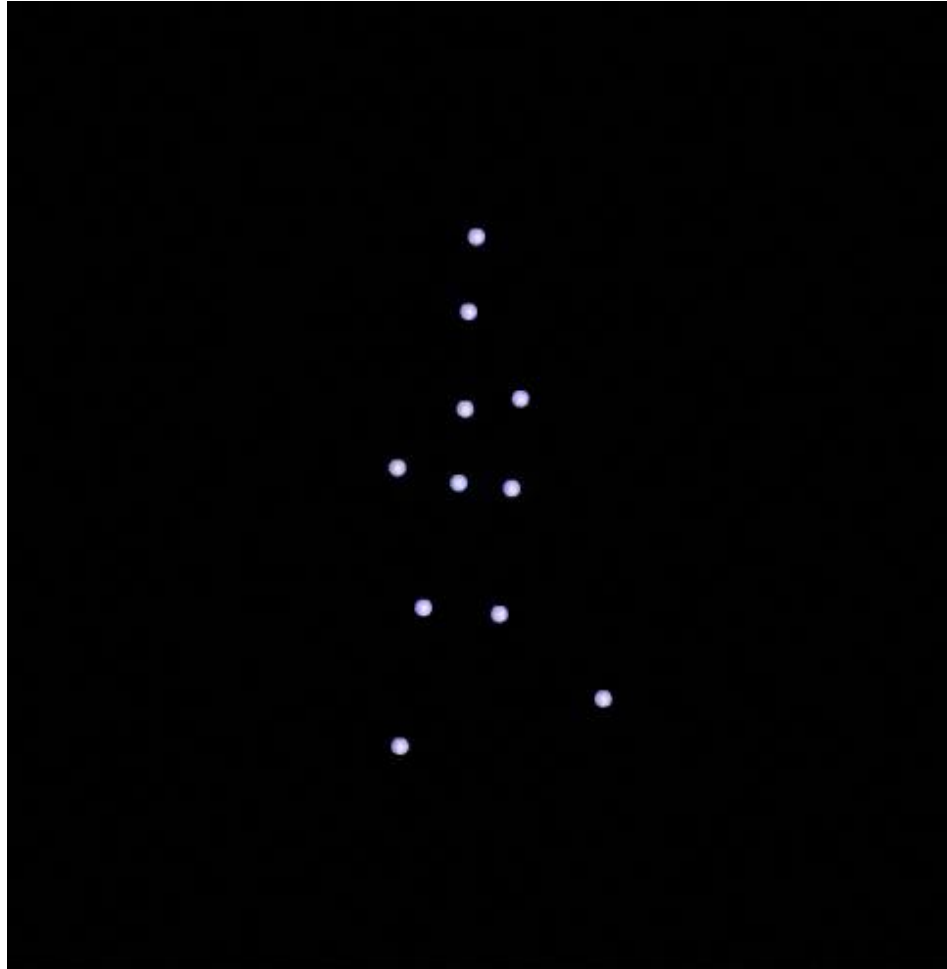
- YouGrabber system (YouRehab Ltd.)



BC's motion processing abilities?



Biological motion processing: Point-light walker (Johansson, 1973)



BioMotion Lab

- ➔ static image: impaired
- ➔ moving human: impaired

Biological motion

Shuffle dots vs Human



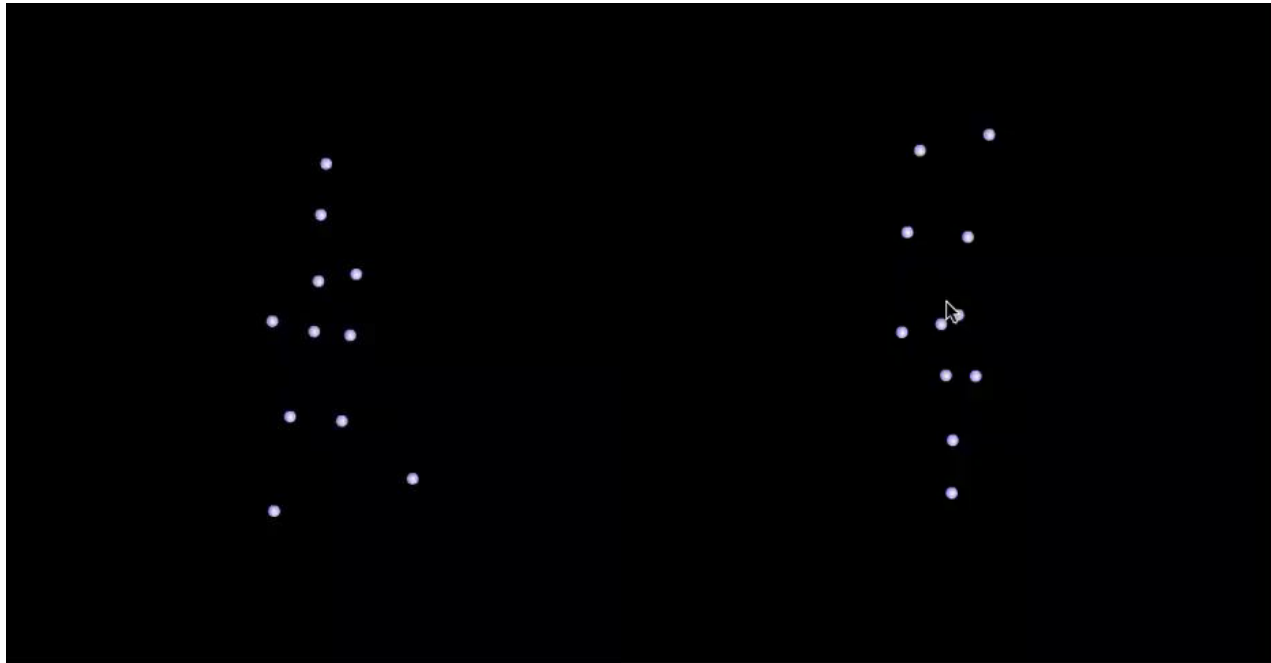
«Which one is the human walker?»

BioMotion Lab

85% correct responses

→ residual biological motion processing, despite impaired object recognition

Human: upright vs inverted

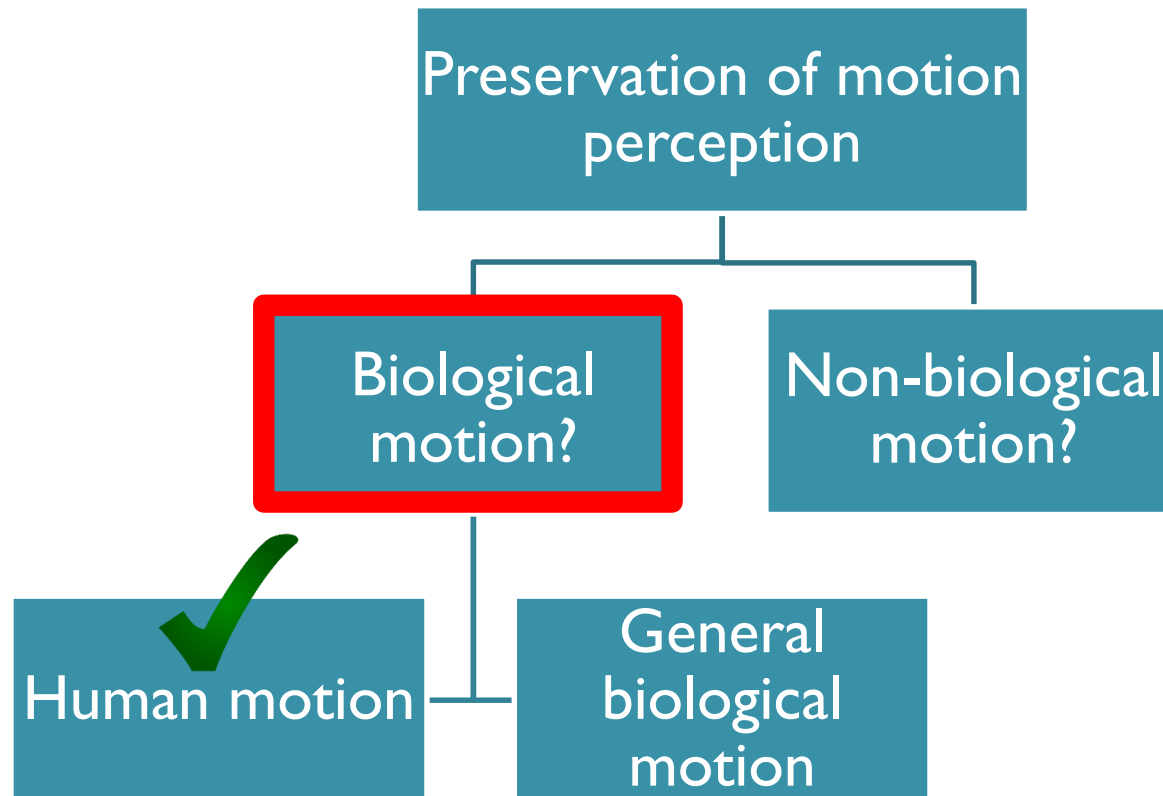


BioMotion Lab

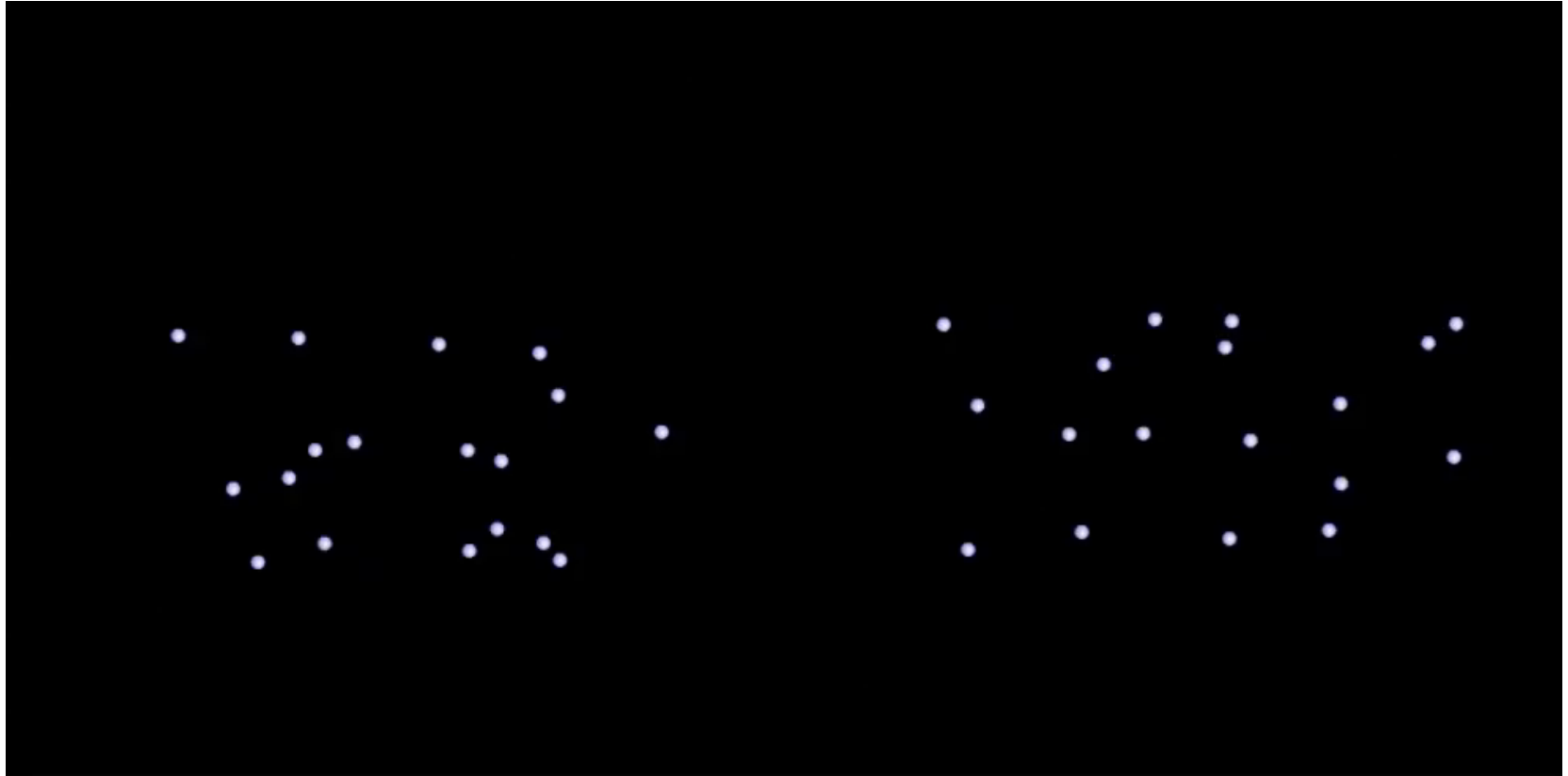
«Which on is the upright walker?»

→ 80% correct responses

Human motion or biological motion in general?



Cat: upright vs inverted



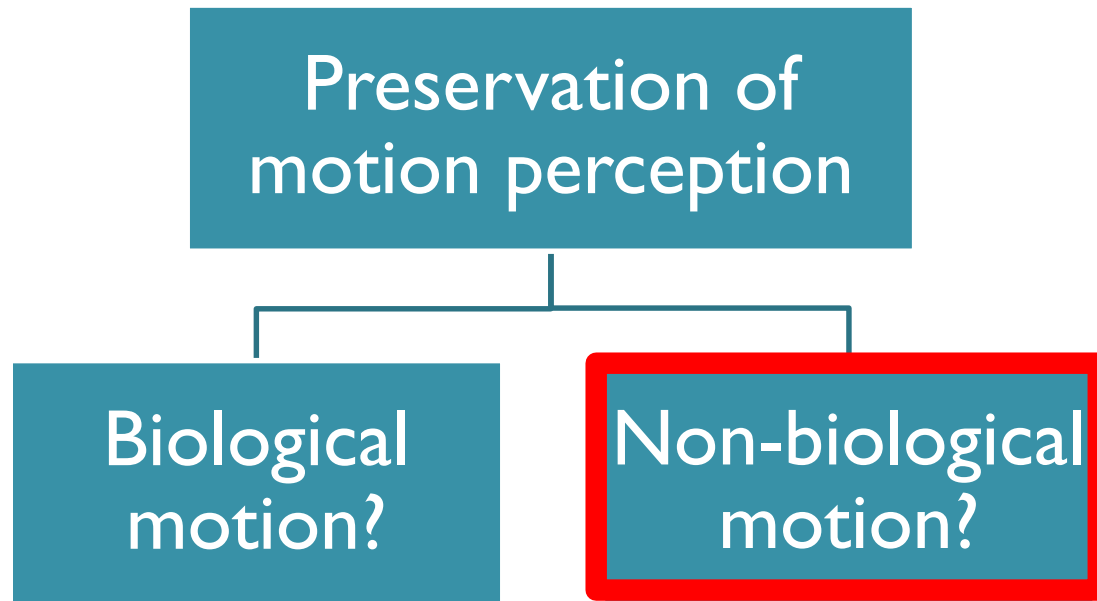
BioMotion Lab

«Which on is the upright cat?»

→ 80% correct responses



Non biological motion?

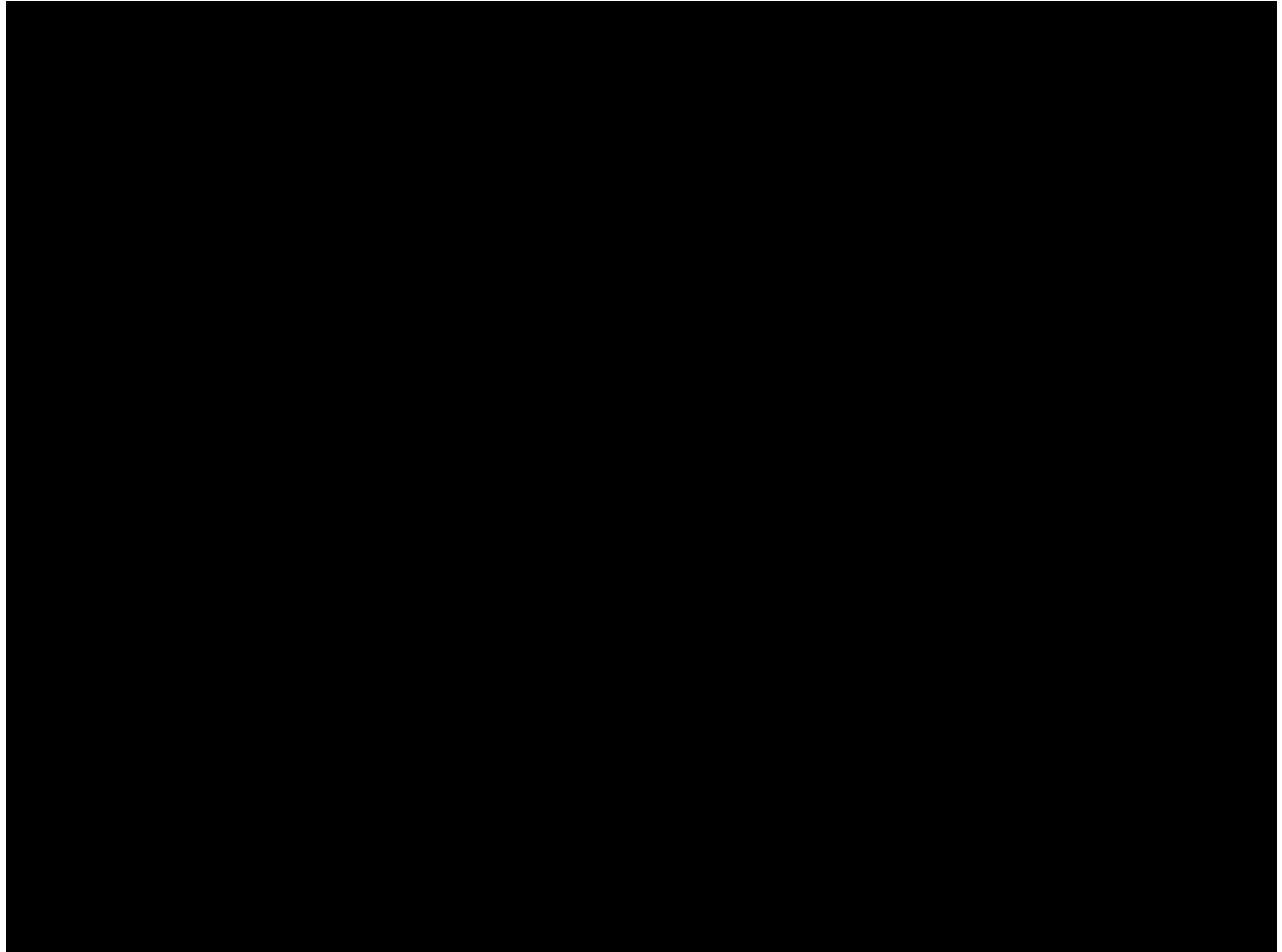


Non-biological motion

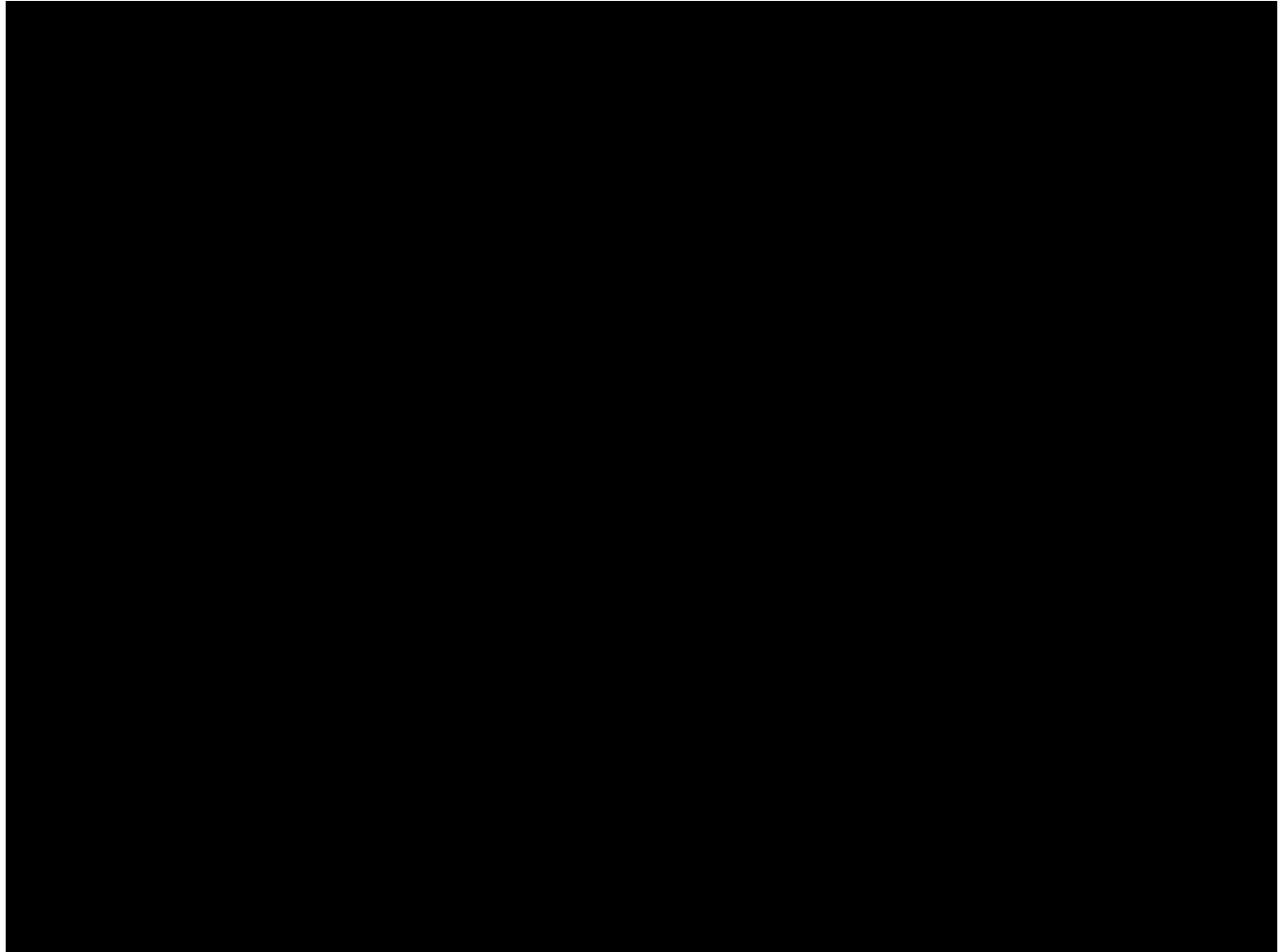


Cogpack®

Shape from motion: impaired



Shape from motion: impaired



Conclusions

- Bottom-up processing partly spared (visual saliency)
- Non-biological shape-from-motion recognition impaired
- Residual biological motion perception despite cortical blindness
- **Spared object recognition is not necessary for biological motion processing**
- Perspectives: faces processing

Reconnaissance des visages

Reconnaissance visages

Acknowledgments

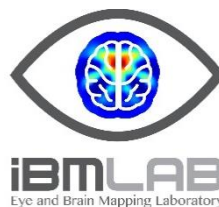
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Thank you for your attention!