



ISTITUTO ITALIANO
DI TECNOLOGIA



5.6 Motoric and Contextual Information in Object Recognition

Nicholas Wilkinson (ESR9)

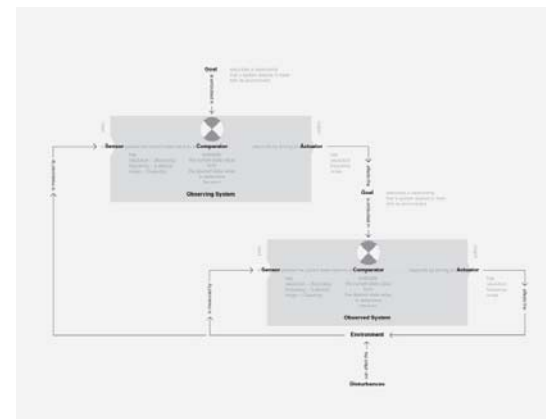
Instituto Italiano di Tecnologia

SEE&ACT node

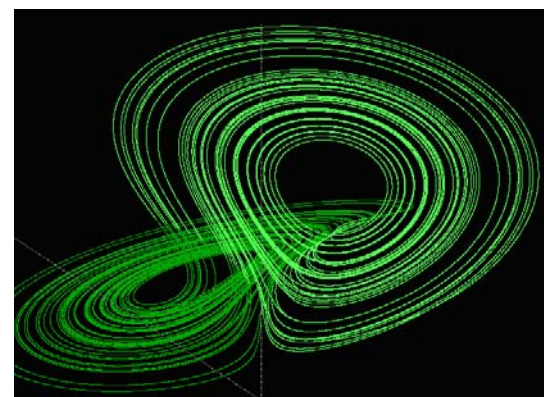


My background

- Englishman in Genova.
- BSc in Computer Science and Artificial Intelligence (2005)
 - Computer Go
- MSc in Evolutionary and Adaptive Systems (2008)
 - Prenatal development of motor skills
- Both from Uni. Sussex in the UK.
- Enactive perspective.
- Social interaction.
- Neuroscience, psychology, robotics.
- Active perception, neural dynamics.
- Supervisors;
 - Giorgio Metta (IIT)
 - Gustaf Gredeback (Uppsala BabyLab)

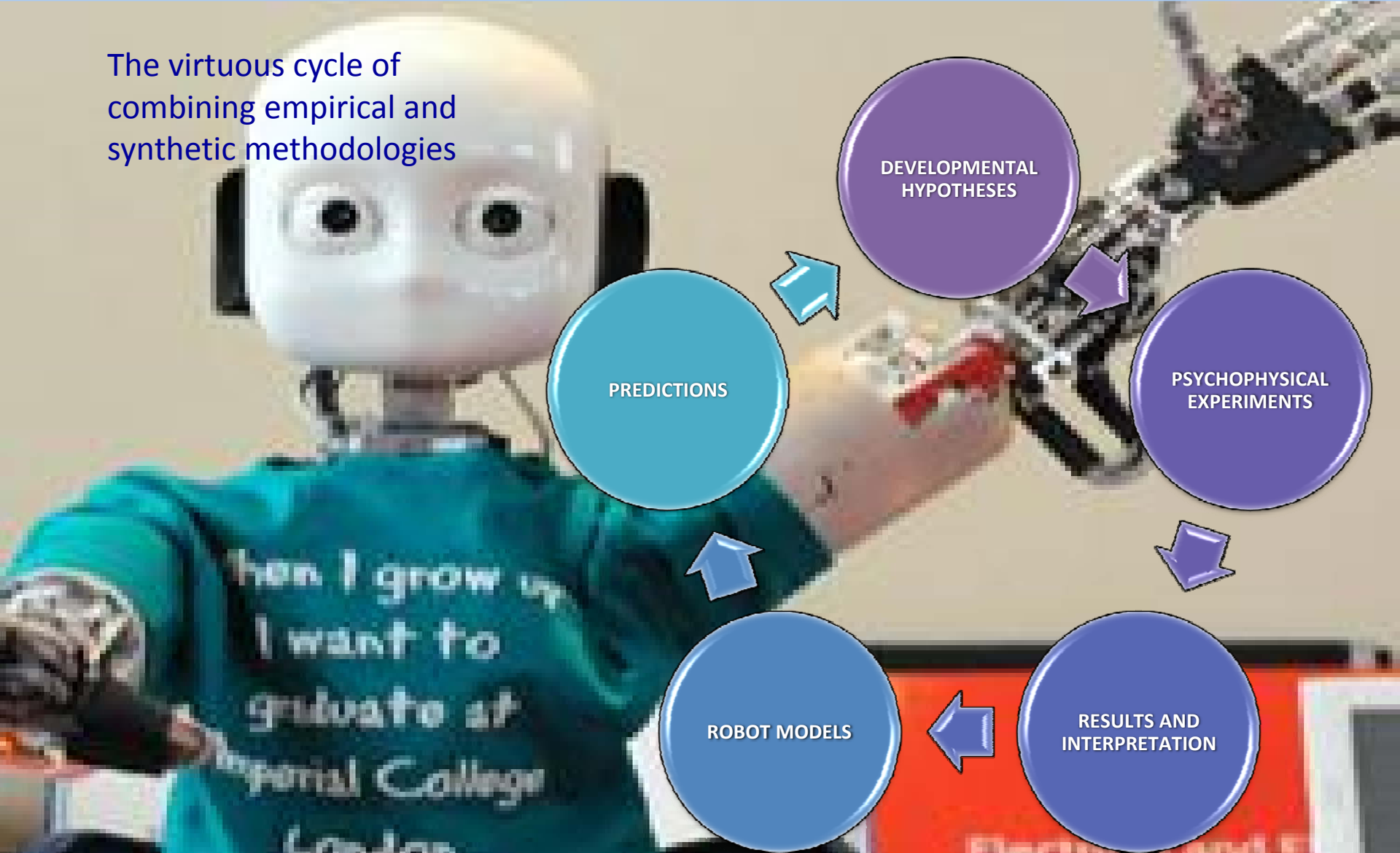
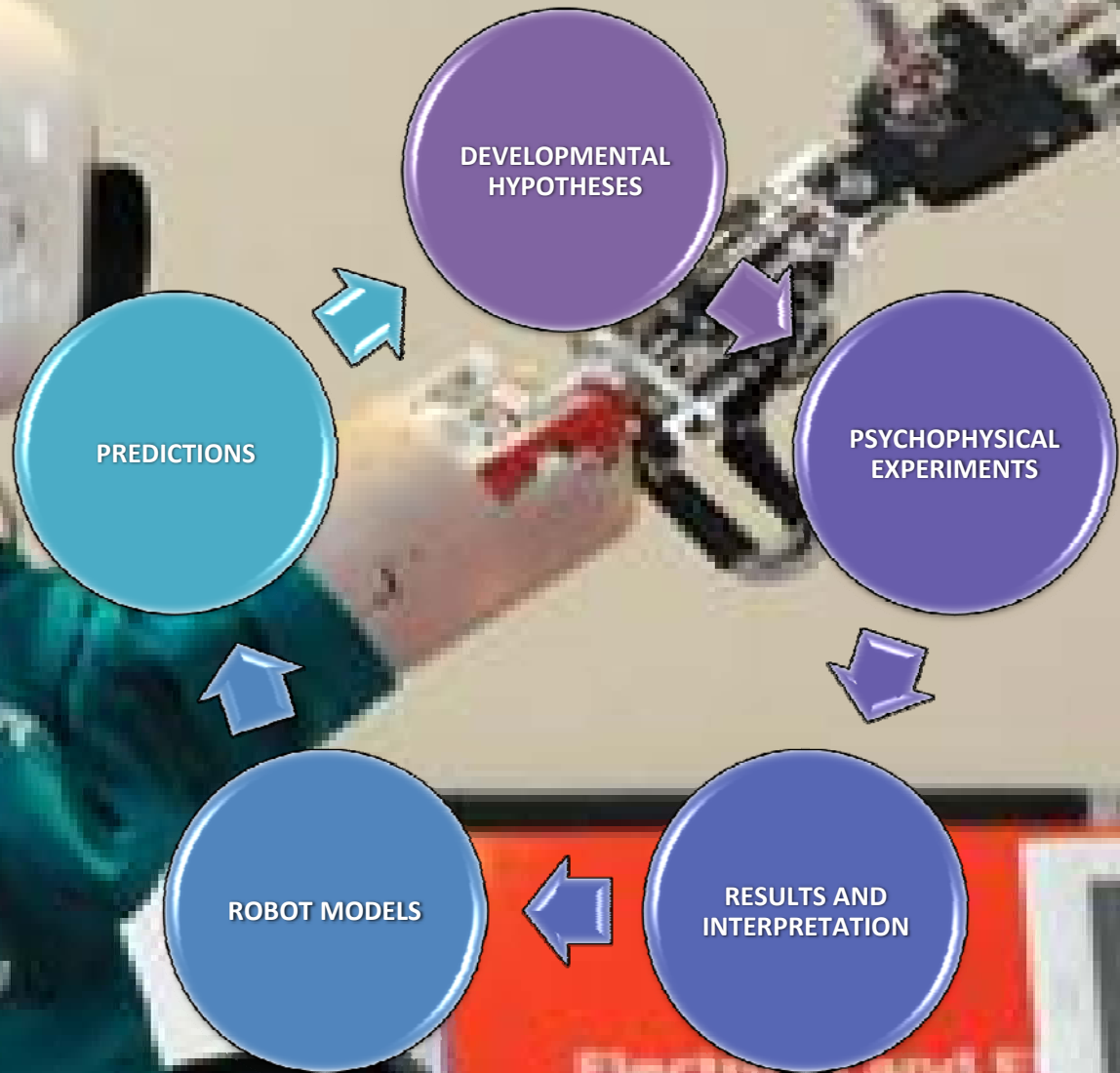


Dynamical systems and cybernetic approaches to enactive cognition.



Psychology -> Robotics -> Psychology

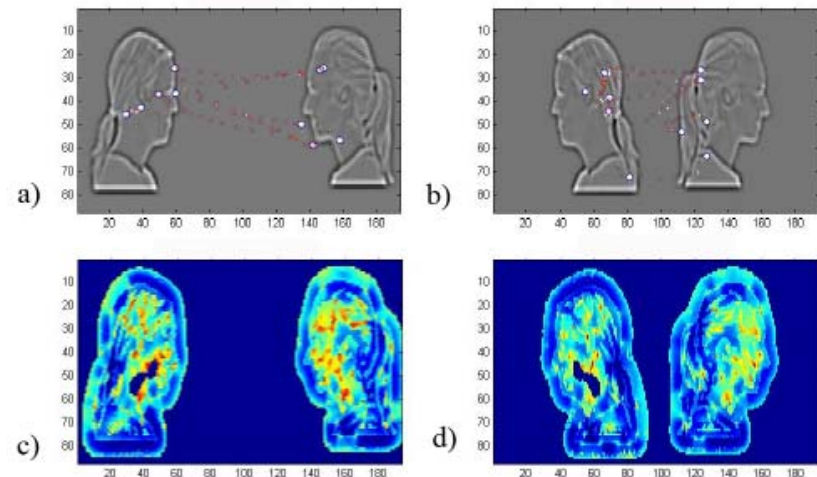
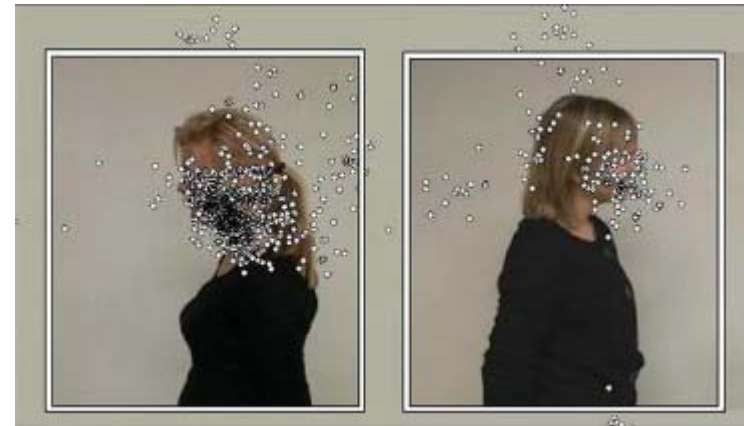
The virtuous cycle of combining empirical and synthetic methodologies



Building Bridges



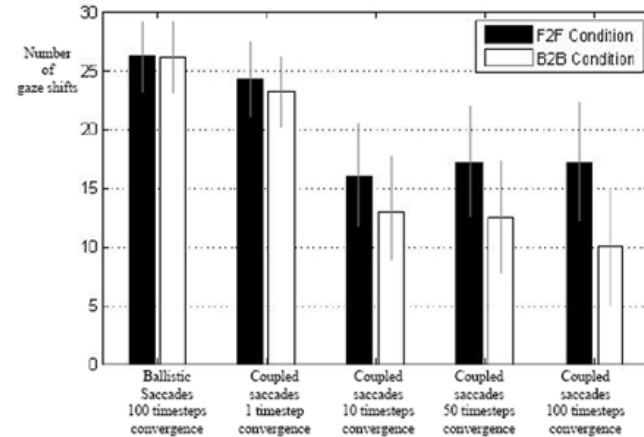
- Working with **Uppsala BabyLab**.
- Forging links with the **Osaka University**, and **Georgetown Medical Centre**.
- Applying neuroscientific findings to visual attention.
- ICDL paper modelling **Andrea's**; predictions inform stimuli design.
- ICMC paper; predictions about infant face preference.
- Test these during Uppsala stay.
- Related work is being undertaken by **Vikram** at Bielefeld.
- Career at the interface of robotics, psychology and cognitive neuro-dynamics.



Results & Publications

- **Modeling the face-to-face effect:**

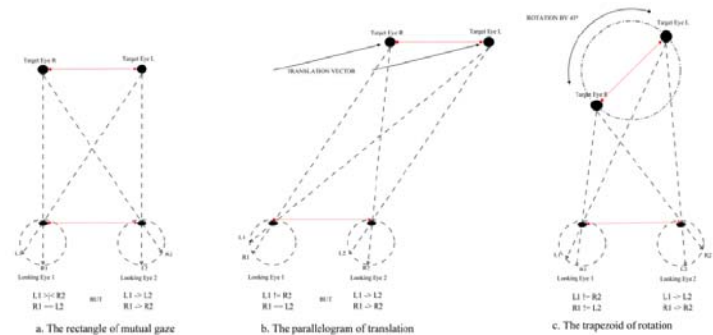
- Investigated a novel attention filter based on neurodynamics observed in visual cortex.
- New explanation of findings based on active visual exploration.
- Predictions feeding back into ongoing experiments.
- Runner-up Best Student Paper, Microsoft Travel Award



- **Inter-facial relations:**

- Novel approach to face detection based on eye distribution.
- Eye contact as a communication channel.
- Recent talk at Bielefeld-Osaka cognitive neuroscience robotics workshop.
- Psychophysical predictions.
- New medium for interaction.

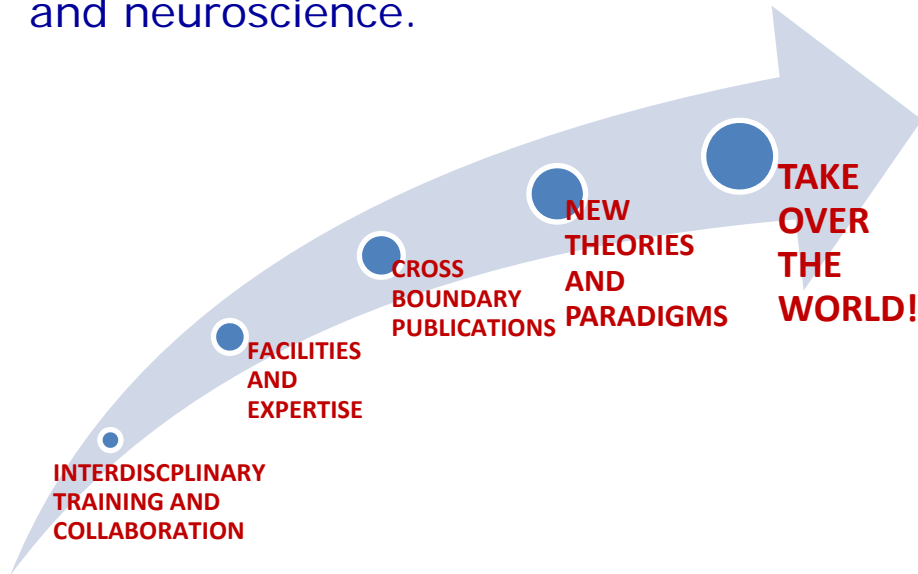
Wilkinson N., Metta G., Gredebäck, G. (in press). Modelling the face-to-face effect: Sensory population dynamics and active vision can contribute to perception of social context. *Proceedings of IEEE ICDL-EpiRob Conference*. Frankfurt



Wilkinson N., Metta G., Gredebäck, G. (in press). Inter-facial relations: Binocular geometry when eyes meet. *Proceedings of the International Conference on Morphological Computation*. Venice

RobotDoC and the Future

RobotDoC provides the perfect interdisciplinary training and context to launch a boundary crossing research career integrating psychology, robotics and neuroscience.



Interaction #1
by Caryl Bryer Fallert

Thank you for your attention!
Please see the RobotDoc website for publications