Self–Other Motion Equivalence Learning for Head Movement Imitation
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Ideas
Q. What equivalence between the self and other should be used to imitate head movement?
A. **Motion** rather than posture.
   - the self → angular displacement vector
   - the other → optical flow
Q. How to find the equivalence?
A. By **tracking the other’s face**.

Learning Model for Head Movement Imitation

- **camera image**
- **robot**: Hebbian learning between the optical flow and the angular displacement vector → **equivalent mapping**
- **human**: turns his/her head
- **robot**: tracks the person’s face → turns its head to the same direction

Experimental Results
- before learning
- after learning (online, a few minutes)

Conclusions
- **Motion** provides the self–other equivalence for imitation.
- **Tracking the other’s face** enables a robot to have experiences of turning its head to the same motion direction.
- Encoding input and output into **motion selective neurons** enables one-to-one equivalent mapping.

References