

ME 599/EE 546: **Biology-** **inspired robotics**

Lecture 3

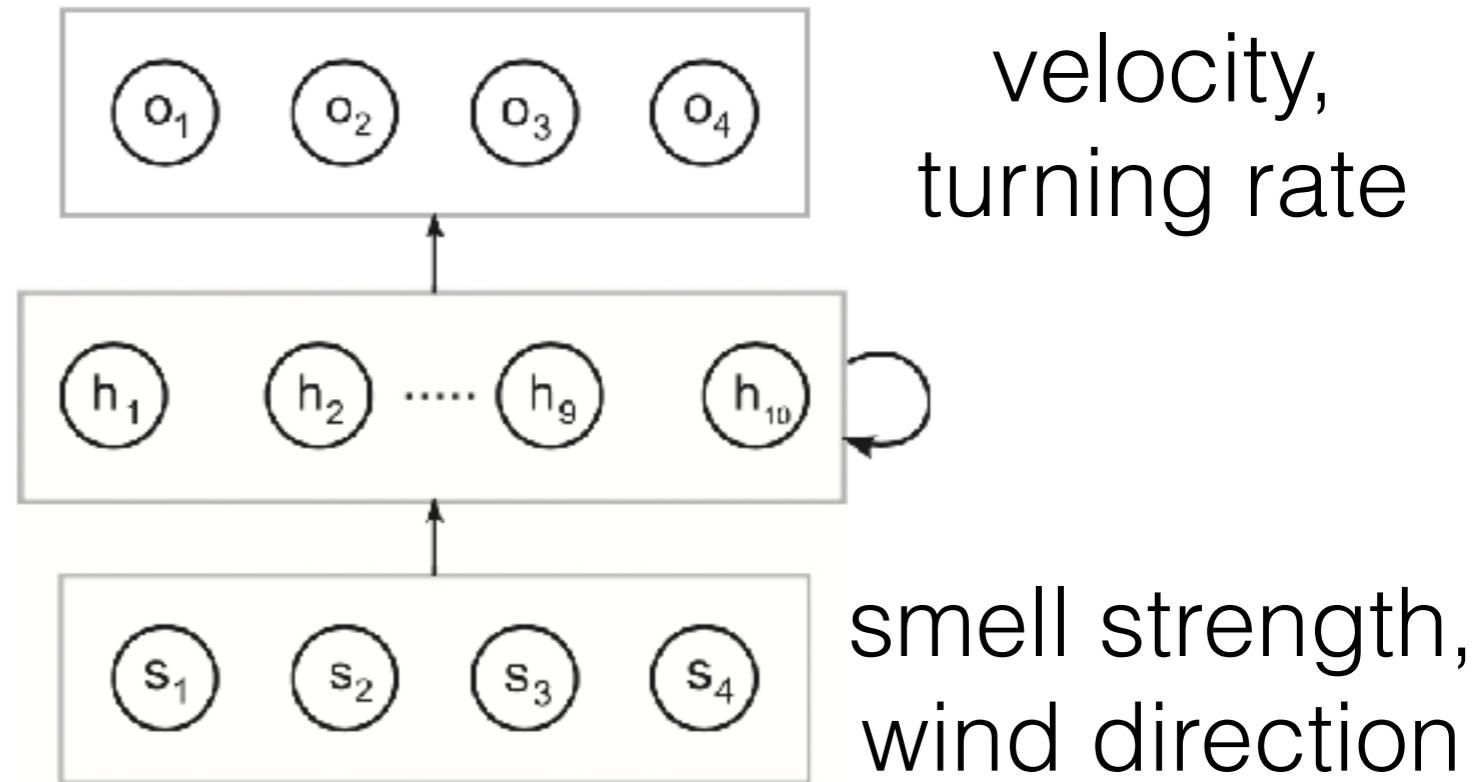
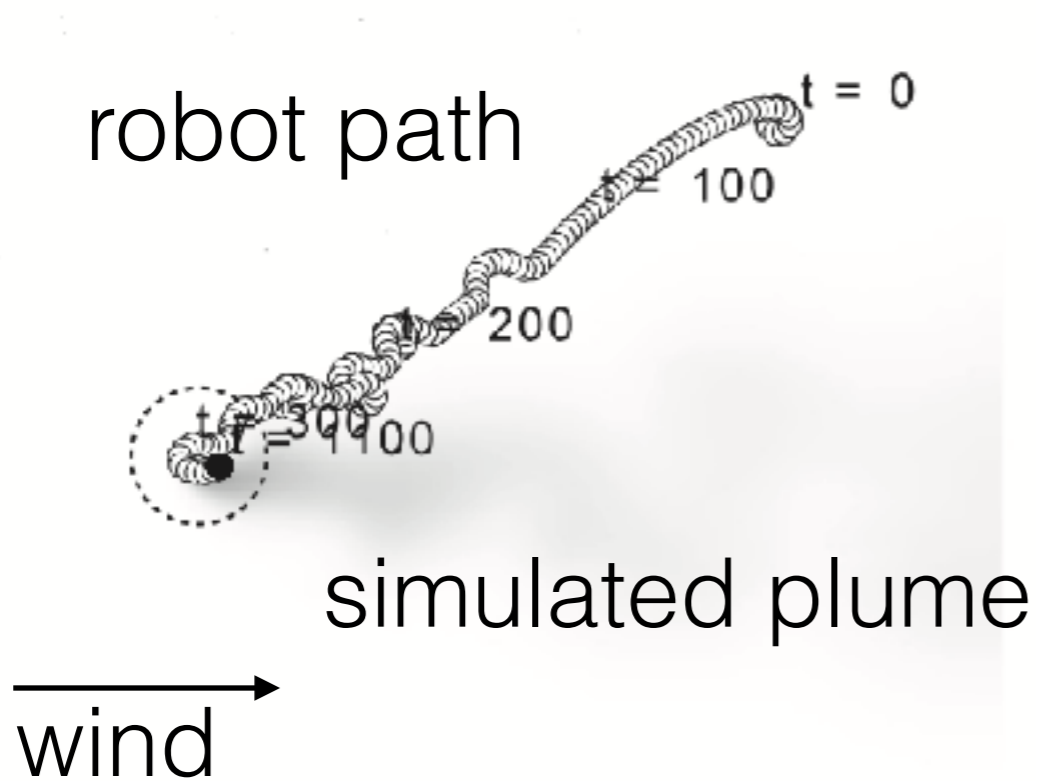
Sawyer B. Fuller

Goals:

- suggestion for how to read an academic paper
- suggestions for how to do background research for papers and term project
- description of term project
- presentation and discussion of Paper 1

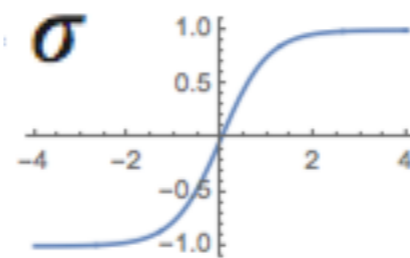
“Evolutionary robotics approach to odor source localization”

recurrent neural network



$$o_i = \sigma \left(\sum_{j=1}^N w_{ij} \sigma(h_j + \theta_j) + \theta_i \right)$$

weights and biases



hyperbolic tangent (saturates output)

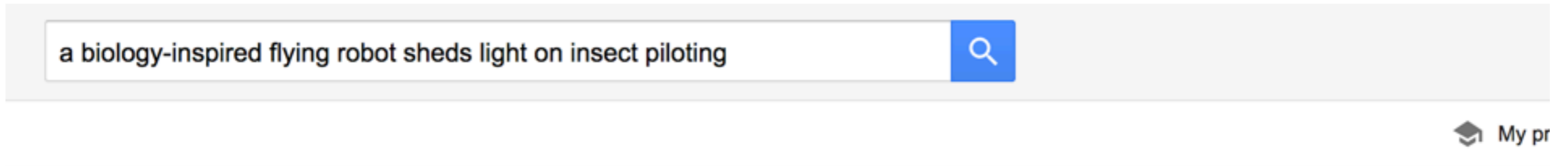
evolution:
vary parameters
a little bit,
keep
if it works better

how to read a paper

1. read the abstract - 2-5 min
2. look through the figures - 5-10 min
3. read the introduction - 5-20 min
4. read the conclusion - 10 min
5. read the rest of the paper - 1-10 hrs
(depending on difficulty and detail desired)

suggestions for how to do background research

- search for paper in google scholar



[HTML] [A bio-inspired flying robot sheds light on insect piloting abilities](#)

N Franceschini, F Ruffier, J Serres - *Current Biology*, 2007 - Elsevier

When insects are flying forward, the image of the ground sweeps backward across their ventral viewfield and forms an "optic flow," which depends on both the groundspeed and the groundheight. To explain how these animals manage to avoid the ground by using this visual motion cue, we suggest that insect navigation hinges on a visual-feedback loop we have called the optic-flow regulator, which controls the vertical lift. To test this idea, we ...

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[HTML] [sciencedirect.com](#)

↑
more recent relevant work

↑
link to online paper (usually available if you are on UW campus)

if not, try <https://sci-hub.ac/>

upcoming project dates

- <1 page proposals (1 per team/person) due on Canvas by class time on Monday Oct 16
- Mid-term project update presentations Nov 6, 8
- Final project presentations Nov 27 and 29
- Final proposals due Mon Dec 4 on Canvas

go over project guidelines