Modelling Central Pattern Generators

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OIST Collaborative International Undergraduate Workshop

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Outline

1. Learning Goals
2. What do you need for a Central Pattern Generator?
3. Today's practical
4. Summary

Learning Goals

Thinking

- Consolidate what you have learnt in lectures this week
- Think through the building blocks of a Central Pattern Generator

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Doing

- Use the Copasi software package for biomedical modelling
- Simulate a Central Pattern Generator under varying conditions

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Feeling

- Appreciate how complexity emerges from simple building blocks
- Gain confidence in using computational models

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Edinburgh

Scotland

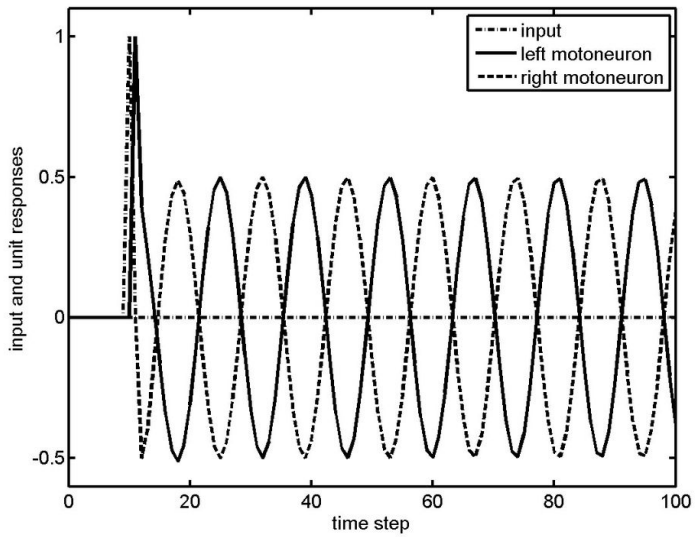
http://gaygordonsedinburgh.com

Austria

Eadweard Muybridge

What are Central Pattern Generators for?

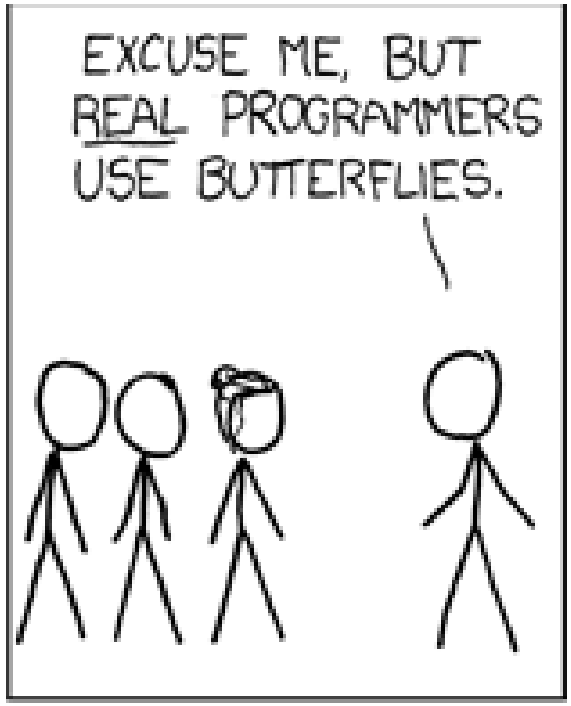
- Animal locomotion
- Breathing
- Swallowing
- ...



Thomas.haslwanter. Cpg output. Licensed under CC BY-SA 3.0 via Wikimedia Commons

Let's simulate a Central Pattern Generator

Let's simulate a Central Pattern Generator



R. Munroe. Real Programmers. xkcd webcomic `https://xkcd.com/378/`

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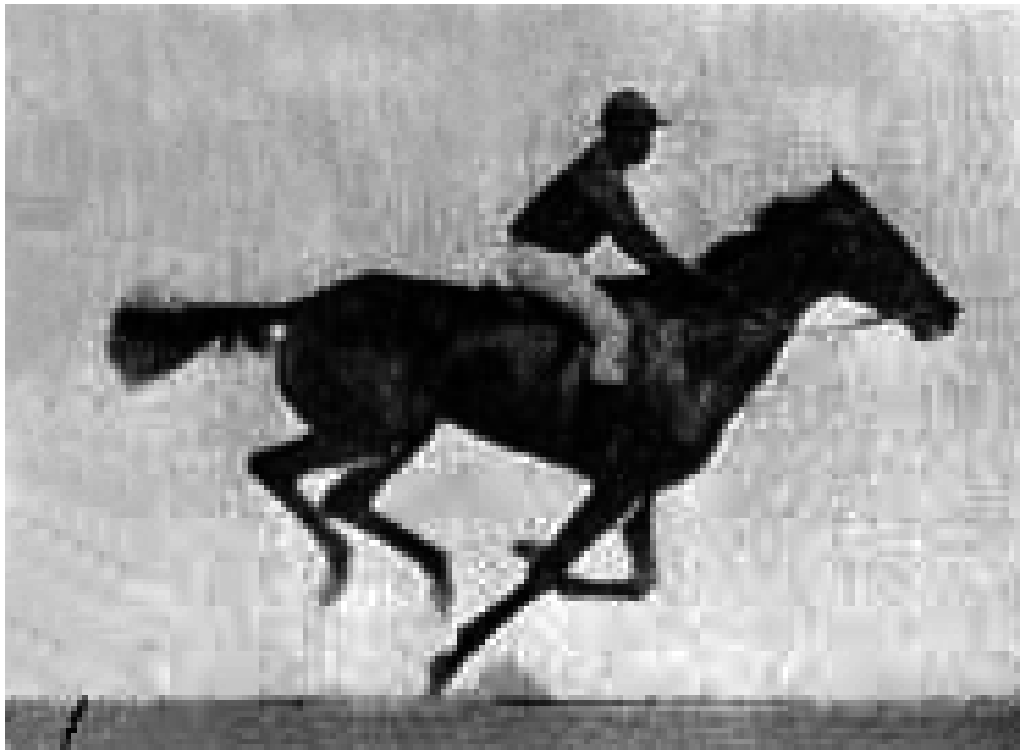
Today's practical

- Examining a simple (2-oscillator) CPG
- Modelling animal gait



Eadweard Muybridge

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What did you learn today?

- Go to `https://answergarden.ch/view/314922`
- Answer the question