

ENGF0034: Design and Professional Skills

Introductory lecture



Prof. Martin Benning
01 October 2024

ENGF0034 2024/25 is a team effort



Chika Nweke



Yuzuko Nakamura



Fiona Truscott



Sunny Bains

Teaching Assistants



Alexandra Valavanis



Aiden Li

And many more

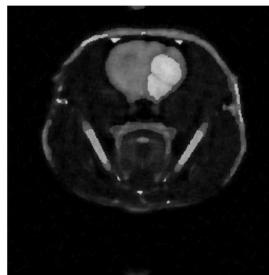
Who am I? Professor of Inverse Problems



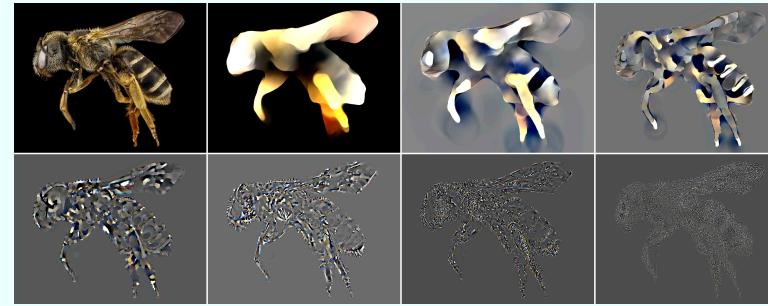
Martin Benning

Areas of expertise:

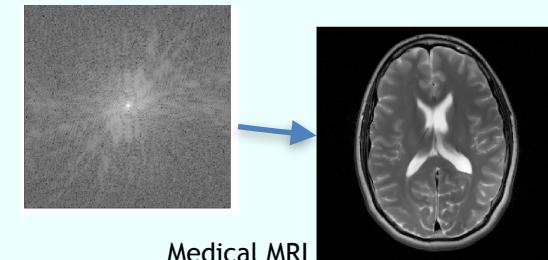
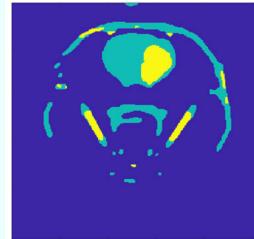
- Inverse & Ill-posed problems
- Regularisation theory
- Machine learning
- Optimisation
- Industrial & medical Imaging
- Image processing



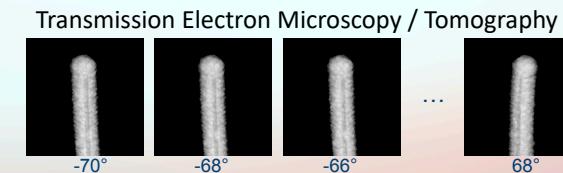
Joint reconstruction & segmentation



Nonlinear spectral decomposition



Medical MRI



Transmission Electron Microscopy / Tomography

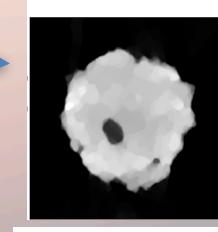
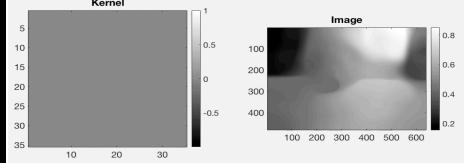


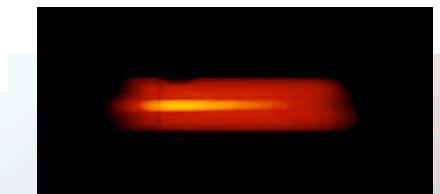
Image reconstruction



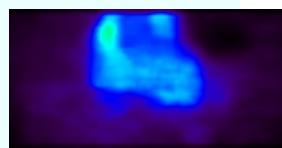
Blind image deconvolution



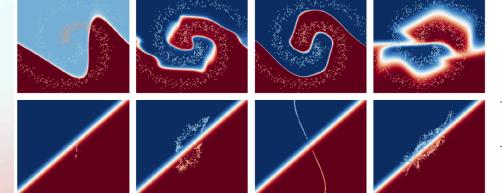
Industrial MRI



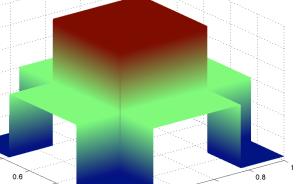
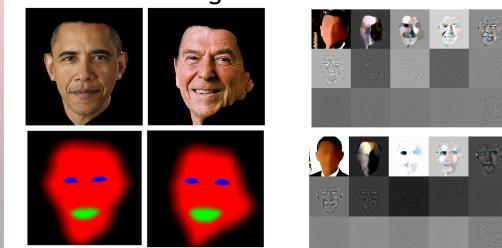
Medical PET



Nonlinear eigenfunctions

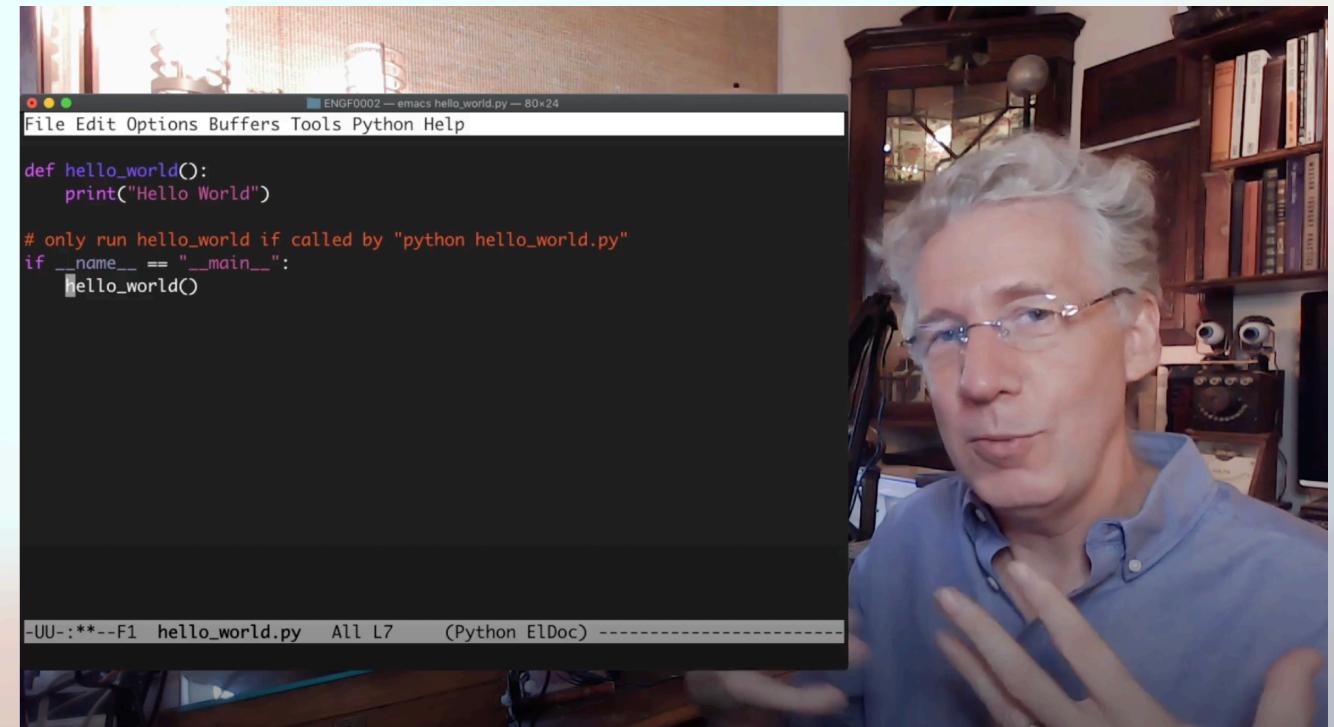


Nonlinear image fusion



This module follows a flipped classroom approach

- Lecture videos by Mark Handley will be released (usually) **Mondays** and **Wednesdays**
- You are supposed to **watch the videos** on release and...
- ...**Ask questions** via [Piazza](#)
- Questions will be addressed in live sessions Tuesdays and Fridays (Roberts G06)
- **Assessments** will be released via [git](#)
- **Drop-in clinics** will take place as extra support for those new to programming



Let us checkout the module [Moodle](#) & [git](#) pages

Assignments

- Week 1 - 2: Introductory programming assignment
- Week 2 - 3: Debug the bomber game
- Week 3 - 5: Debug the frogger game
- Week 5 - 7: Write a tetris autoplayer (20%)
- Week 7 - 9: Write pacman protocol specification (15%)
- Week 7 - March 22 in Term 2: Ethics report (15%)
- Term 2 Reading Week: Presentations (10%)
- + Scenario assessments in Term 2 (remaining 40%)

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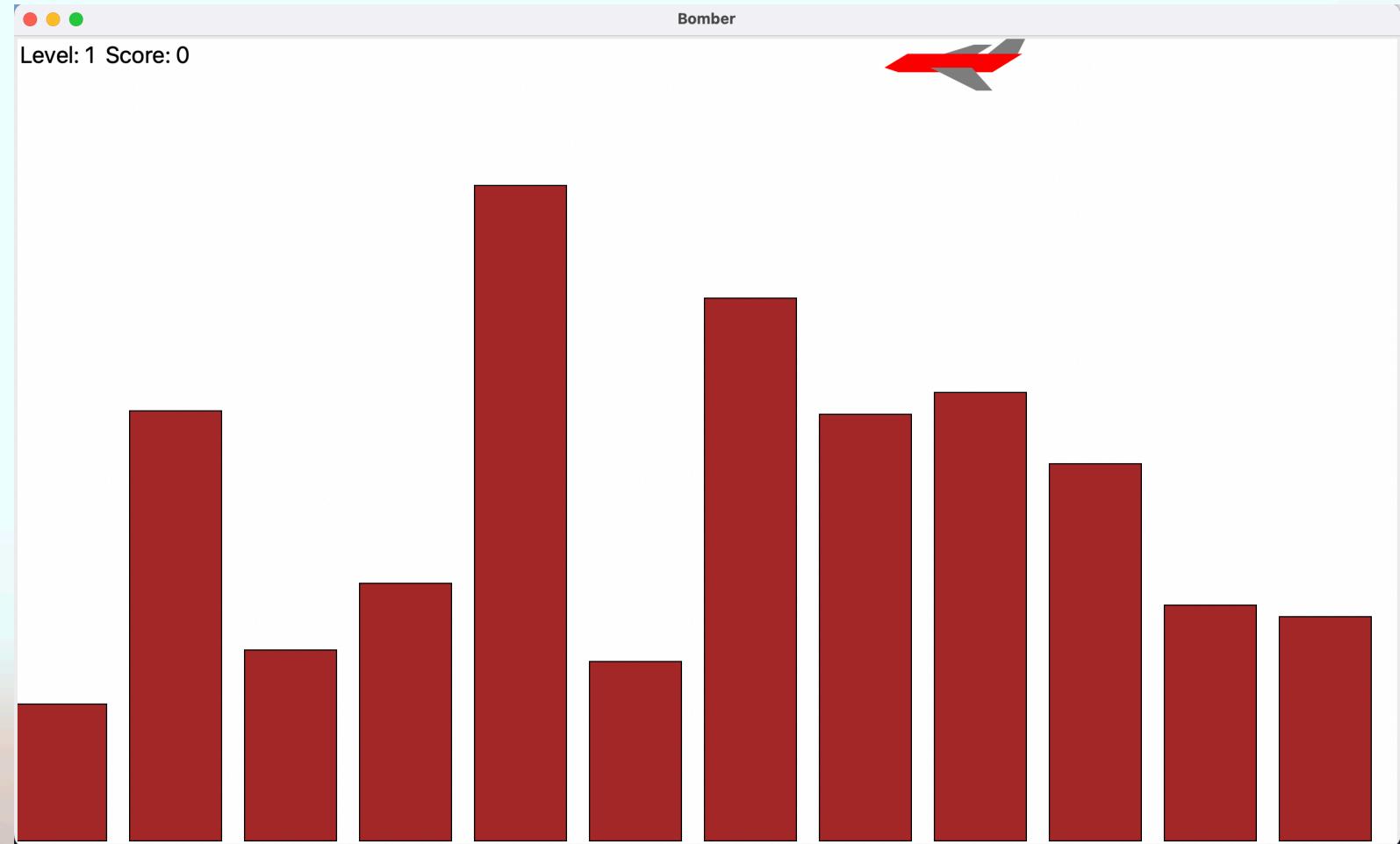
Do not plan time away
during reading week!

Assignments

Assignment 2: (Canyon) Bomber

Classic Atari Arcade Game from 1977

Task: Find five bugs that make the game unplayable, and fix them!

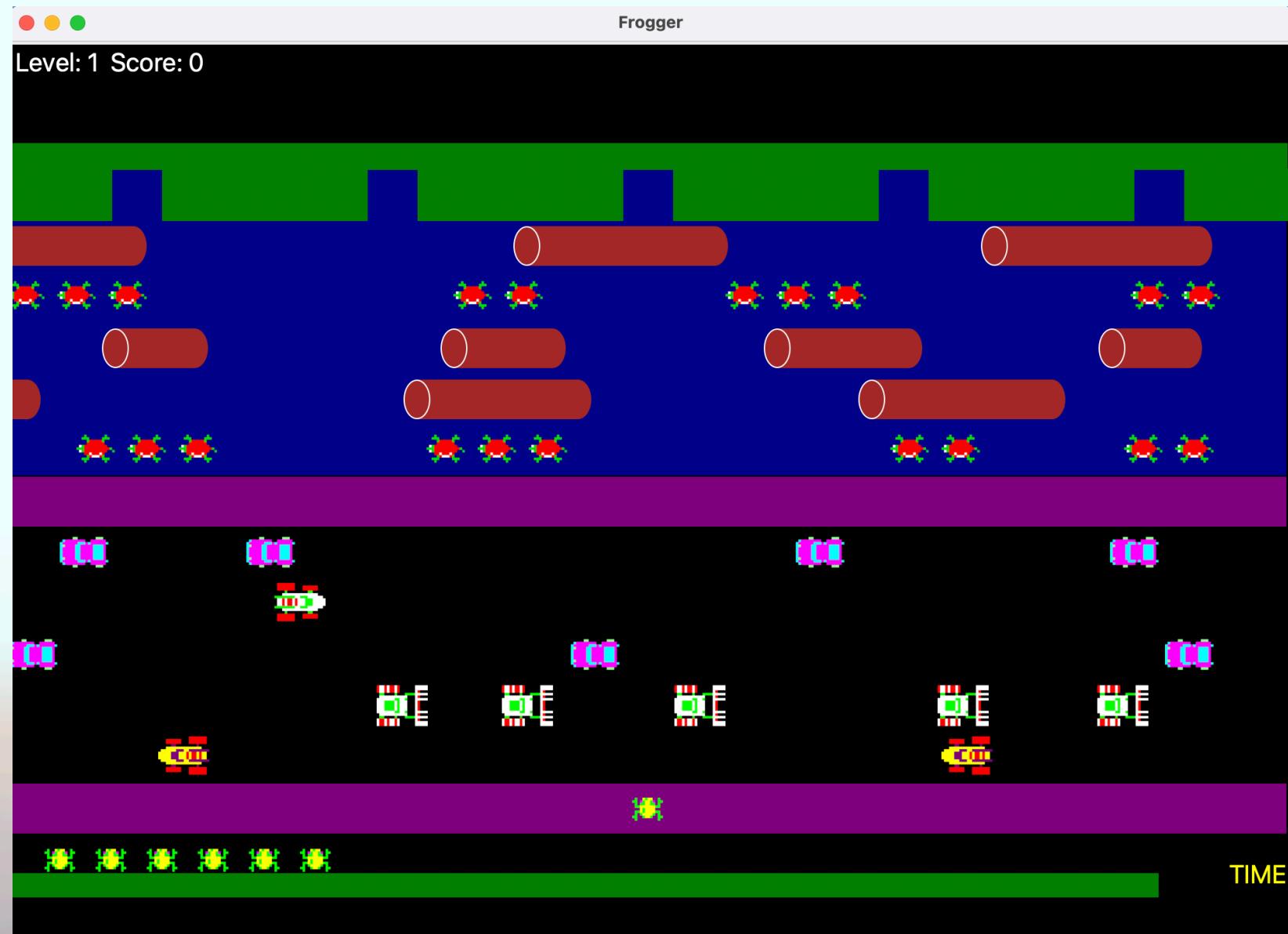


Assignments

Assignment 3: Frogger

Classic Konami/Sega Arcade
Game from 1981

Task: Find five bugs that make
the game unplayable, and fix
them!



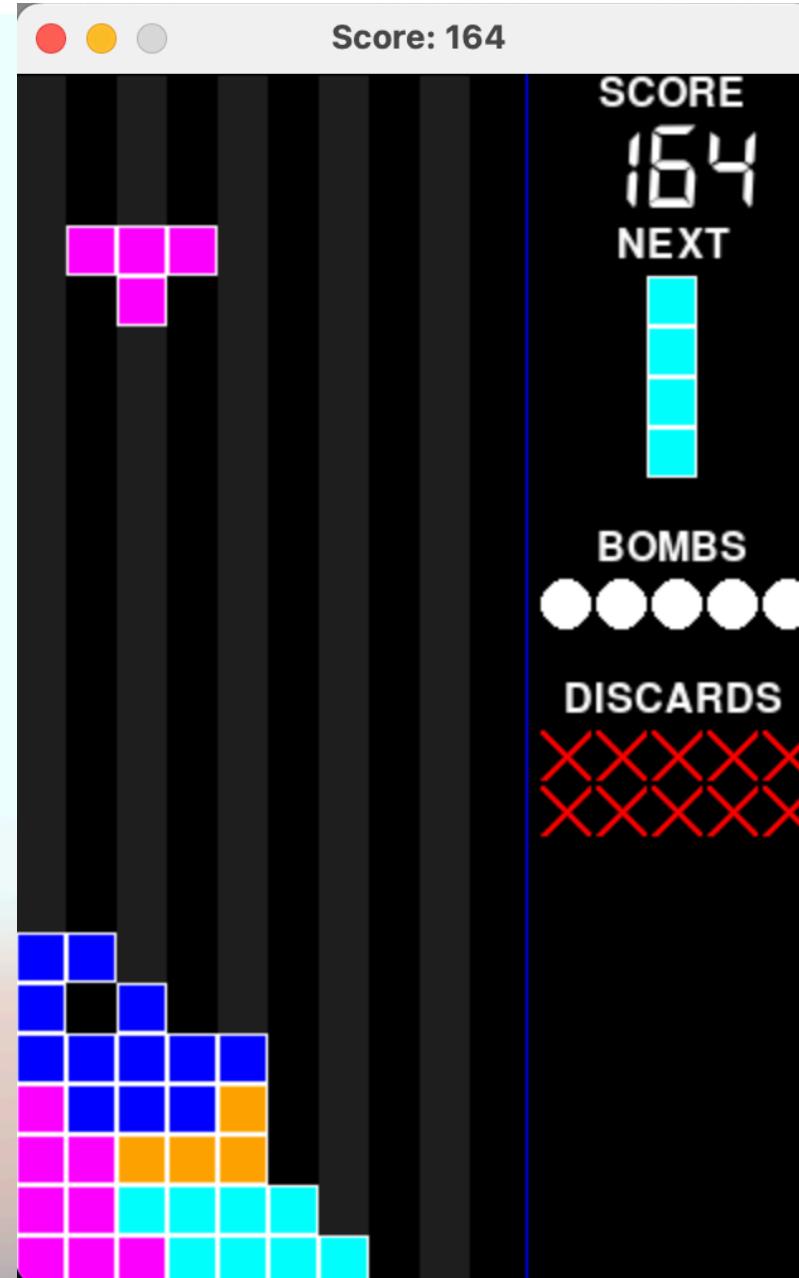
Assignments

Assignment 4: Tetris autoplayer

Puzzle video game created by Alexey Pajitnov in 1985

Game Boy version by Nintendo popularised Tetris in 1989

Task: write a program that plays Tetris and compete with your peers



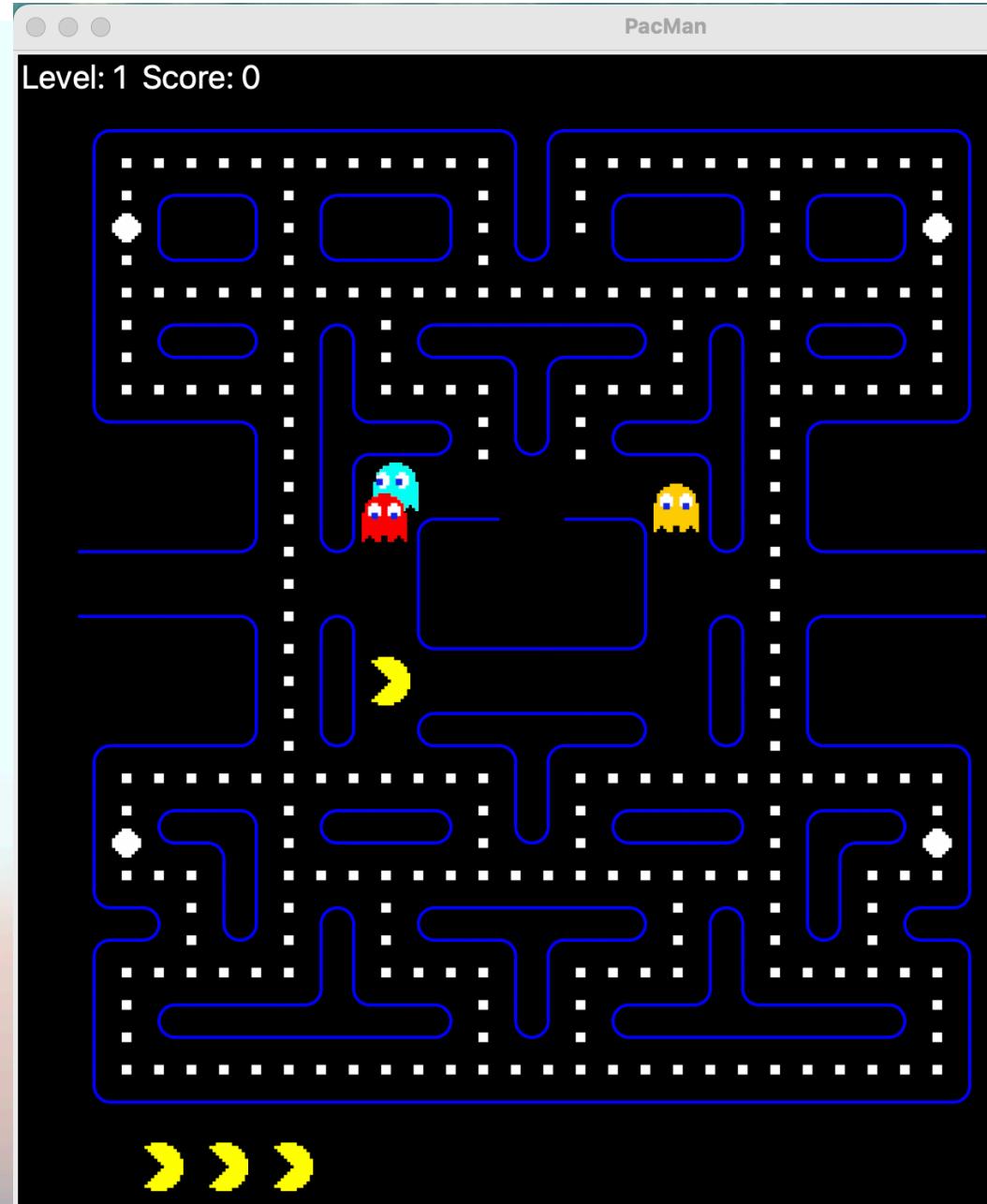
Assignments

Assignment 5:
Write specification
for Pacman game

1980 Maze video game

Special network version of the game

Task: write a better
network protocol
specification for this game



Other remarks

- For assessments 1 - 3 communicate and work with your peers
- If you have questions, it is likely your peers will have similar questions → ask via Piazza, **not** via e-mail
- Do not only use Piazza when you have questions; help your peers and answer their questions, too!
- However, do not ask or post solutions for summative (marked) assessments (4 & 5) → punishable offence
- Make use of Piazza and the drop-in clinics; do not suffer in silence!
- I know it is tempting to use Large Language Models (LLM, like ChatGPT etc.), but there are risks:
 - Often you require programming experience to understand LLM outputs
 - More importantly, you require experience to identify **wrong** outputs!
 - It is not allowed to use LLMs for summative (marked) assessments!

This Friday (October 4)

Pebble in the pond!



When? 11 am - 1 pm

Where?

Holiday Inn Bloomsbury,
Booker and Turner Suite

Next Tuesday (October 8)

Teamwork - Live Session

with Dr Fiona Truscott



When? 9 am - 11 am

Where?

Roberts G06

Now / Next hour ➔ Greatest common denominator and Python basics!