# Concurrency
## from an
## Empirical Modelling
## perspective

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# Sources and background

- Eight lectures on concurrency under the Concurrency tab on CS405 2008 webpage
- Originally based on lectures on "EM for Concurrent Systems" (MSc 1992-7)

The ODA framework is best understood, and motivated, by its use in the context of concurrency …

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# Lecture 1 – a brief review

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# Varieties of Concurrent System

formal approaches (concurrent processes) and informal experience ("everyday concurrency")

compare computer science and natural science

compare the contrast of *program* and *model*

challenge of modern computing applications

why such a gulf between behaviour as experienced and behaviour as abstracted?

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# Commonsense concurrency

- What counts as 'concurrent' depends on who is observing, and how they observe
- what is concurrent depends on what the observer can distinguish and conjoin
- what is concurrent also depends on the observer's viewpoint and faculties
- role of the 'external observer' who perceives ("creates") a concurrent system

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# Agency in commonsense concurrency

1. hearing a waterfall and birds singing
2. listening to a string quartet being played
3. observing the participants in a meeting
4. interacting with a word-processor

… as raising a range of different issues concerning the attribution of agency

## EM analysis of commonsense concurrency

- external observer develops insight through building and interacting with an artefact
- observables constitute 'state' and must have identity through change as perceived by agent
- three views of agency help to locate focus of EM
- fundamental role of 'do-and-see' in identifying dependencies and agency