

#HSMA2018

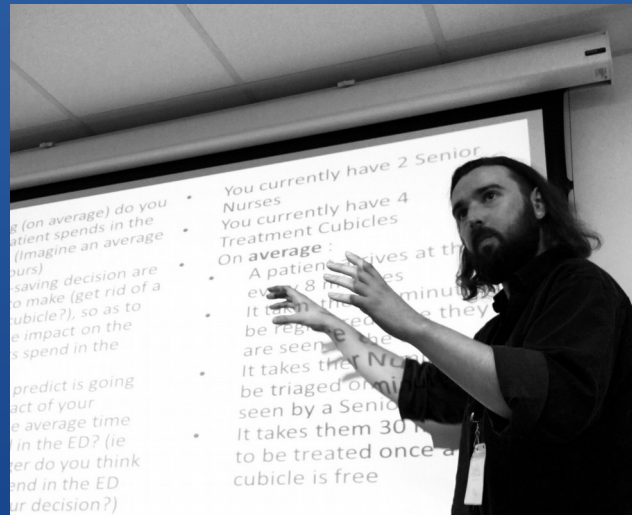
**PenCLAHRC & South West AHSN Health
Service Modelling Associates Programme
2018**

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What is Operational Research?

Operational Research (OR) is a discipline that uses mathematical modelling, computer simulation and analysis techniques to help **inform** decisions, and **improve decision making**



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Goals of HSMA

- Embed Operational Research within NHS organisations
- Increase evidence-based decision making in the NHS
- Develop skills of NHS analysts
- Create embedded “OR Ambassadors”
- Develop and foster collaboration between NHS organisations

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Core Principles of HSMA

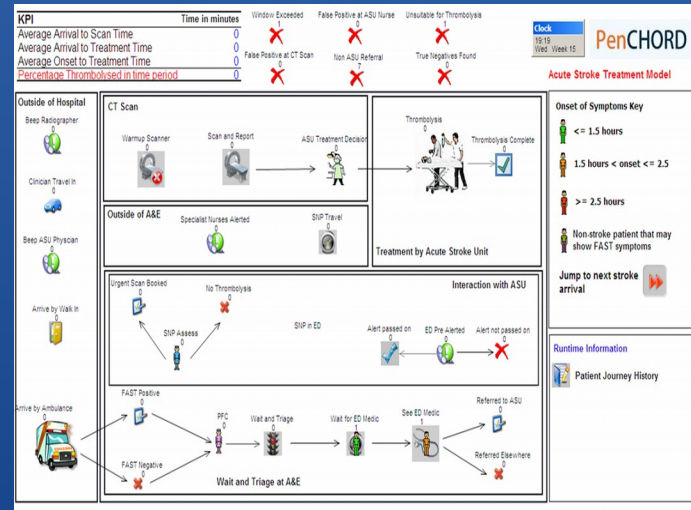
- HSMA's are released for a day a week for a year to undertake a modelling project that is **important, relevant and potentially impactful** for their organisation
- HSMA's are trained :
 - How to manage a modelling project
 - The technical skills to develop models
- HSMA's receive mentoring / guidance from modelling experts, but the the HSMA's **own the projects**
- NHS Workplace Supervisors facilitate the implementation of the projects
- HSMA's come together once a month to share ideas and collaborate

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Dummy's Guide to Selected Operational Research Methods

Discrete Event Simulation

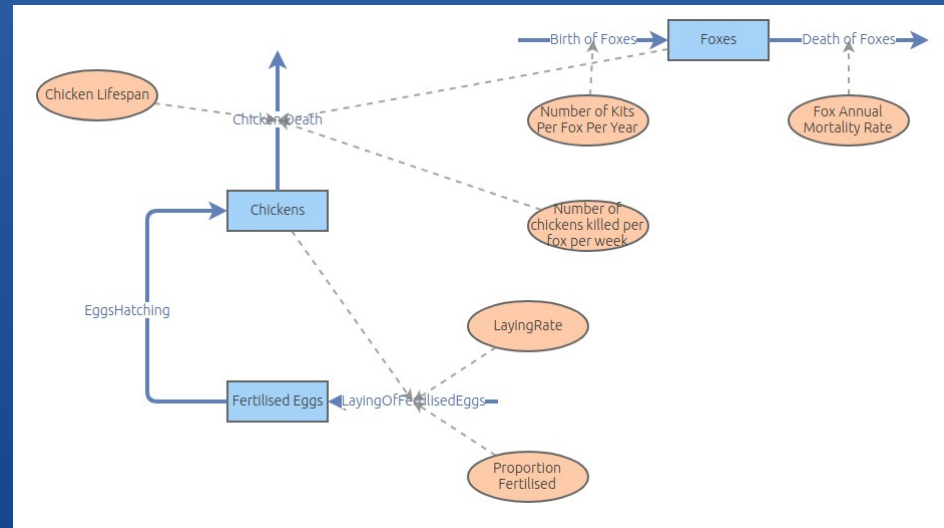
Simulates entities flowing through discrete, sequential processes and the queues between them.



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Dummy's Guide to Selected Operational Research Methods *System Dynamics*

Simulates a system in terms of the flows between elements. Useful for studying patterns of flow over time.

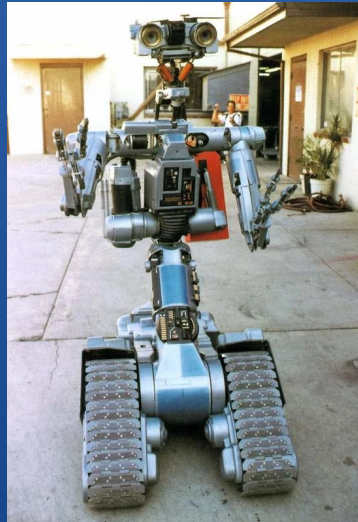


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Machine Learning

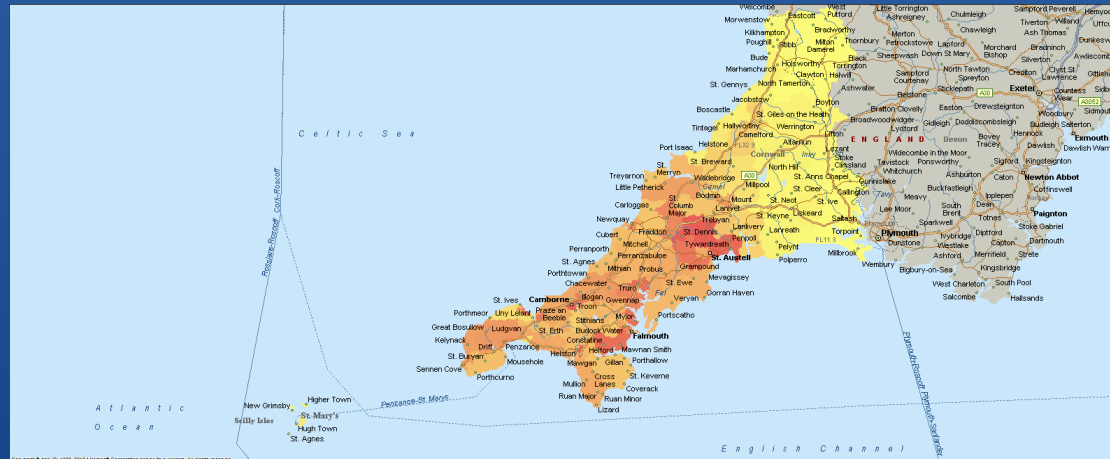
A branch of Artificial Intelligence (AI) that attempts to get a computer to 'learn' inherent patterns that lead to certain 'outcomes'



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Dummy's Guide to Selected Operational Research Methods *Geographic Modelling and Visualisation*

Methods that predict the optimal location for sites (or the impact of site closures) and visualise the information on maps

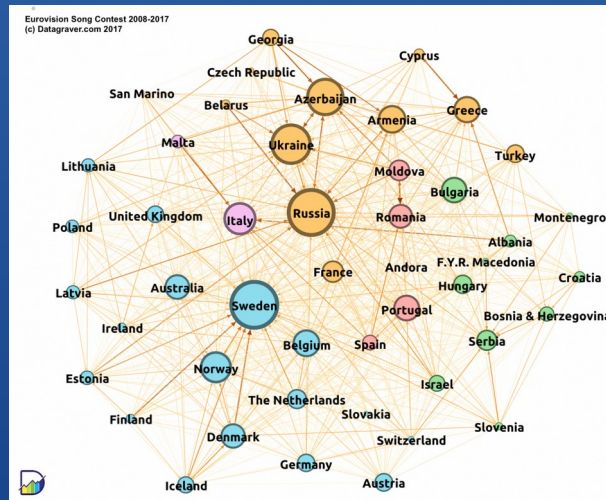


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Dummy's Guide to Selected Operational Research Methods

Network Analysis

Mathematically analysing and representing procedures / things as a network of relationships.



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What's new in 2018?

- Two-phase programme structure
- Free and Open Source Software (FOSS)
- Expanded size
- HSMA Hackathons
- Support from and involvement of SW AHSN

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Two-phase programme structure

3 Months (JAN – MAR)

PHASE 1 : Foundations
of Health Service
Modelling



9 Months (APR – DEC)

PHASE 2 : Applied Health Service Modelling



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Free and Open Source Software (FOSS)

Why?

- Sustainability
- Sharing
- Transferral of skills

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Free and Open Source Software (FOSS)

Software :

- JaamSim and SimPy for Discrete Event Simulation
- InsightMaker for System Dynamics
- Python SciKit Learn toolset for Machine Learning
- Python and QGIS for Geographic Modelling and Visualisation
- Python and Gephi for Network Analysis

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Expanded Size

- Over 50 applications for HSMA 2018
- Applicants asked to submit an initial idea and attend an Open Day in December 2017 for interview
- Panel consisting of PenCHORD, AHSN and PenPIG (Patient Involvement Group members) selected 26 for Phase 1
- Phase 1 HSMAs developed project proposals for Phase 2 and pitched them in March 2018
- 19 HSMAs (15 regular + 4 “Honorary”) taken forward to Phase 2
- Pitches judged on potential impact of projects for patients, the organisation, the health system, practicability of the project and commitment of the organisation to embed Operational Research skills

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HSMA Hackathons

- Evolution of the Learning Set Meeting from HSMA 1
- HSMAAs come together to work on models (for their projects or side projects) with experts on hand to offer advice
- Sharing of ideas, collaboration on model development

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Support from and involvement of SW AHSN

- Funding of PenCLAHRC resources to develop and deliver the programme
- Contribution to the design of the new programme
- Supported selection of the HSMAAs

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The Future of Operational Research

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**What has Operational
Research done for
us?**