Current Topics in Data Science
&
Current Topics in Artificial Intelligence and Machine Learning

Hamid Dehghani
School of Computer Science
Birmingham
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Welcome

- Shared module delivery
  - Current Topics in Data Science
  - Current Topics in Artificial Intelligence and Machine Learning
- Different Assessment criteria for each module

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Timetable and Delivery

- A set of specialised topics delivered by experts
- Online videos and reading material published every week
- Lectures on Wednesday (10 am)
- Tutorial/Discussions on Monday (11 am)
  - See Canvas

Office hours

- Office hours are 9am-10am Tuesdays:
  - Current Topics in Data Science:
    Hamid Dehghani (CS 241)
  - Current Topics in Artificial Intelligence and Machine Learning:
    Hamid Dehghani (CS 241)

Timetable and Delivery

Lectures			
Date	**Time**	**Lecturer**	**Topic/Title**
17-Jan-24	10:00 am	Hamid Dehghani	Preliminary material: Alegbra, Regression, Regularisation etc
24-Jan-24	10:00 am	Hyung Jin Chang	Vision-based Pose Estimation of Human Body/Hand/Gaze/Object
31-Jan-24	10:00 am	Alex Krull	Denoising in Scientific Imaging
07-Feb-24	10:00 am	Qingjie Meng	TBD
14-Feb-24	10:00 am	Peter Tino	Learning from Time Series Data
21-Feb-24	10:00 am		Assignment: Self Study
28-Feb-24	10:00 am	Aleš Leonardis	Computational Photography
06-Mar-24	10:00 am	Jinming Duan	Make machines learn better with prior knowledge
13-Mar-24	10:00 am	Kashif Rajpoot (Hamid, on camp	Computational Pathology
20-Mar-24	10:00 am	TBA	Guest Lecture in NLP
27-Mar-24			Easter Break
03-Apr-24			Easter Break
10-Apr-24			Easter Break
17-Apr-24			Easter Break
24-Apr-24			Assignment: Self Study

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Timetable and Delivery

Tutorials

Date	Time	Lecturer	Topic
15-Jan-24	11:00 am	Hamid Dehghani	Introduction
22-Jan-24	11:00 am	Hamid Dehghani	
29-Jan-24	11:00 am	Hamid Dehghani	
05-Feb-24	11:00 am	Hamid Dehghani	
12-Feb-24	11:00 am	Hamid Dehghani	
19-Feb-24	11:00 am	Hamid Dehghani	Assignment Help
26-Feb-24	11:00 am	Hamid Dehghani	
04-Mar-24	11:00 am	Hamid Dehghani	
11-Mar-24	11:00 am	Hamid Dehghani	
18-Mar-24	11:00 am	Hamid Dehghani	
25-Mar-24			Easter Break
01-Apr-24			Easter Break
08-Apr-24			Easter Break
15-Apr-24			Easter Break
22-Apr-24	11:00 am	Hamid Dehghani	Assignment Help

Lectures

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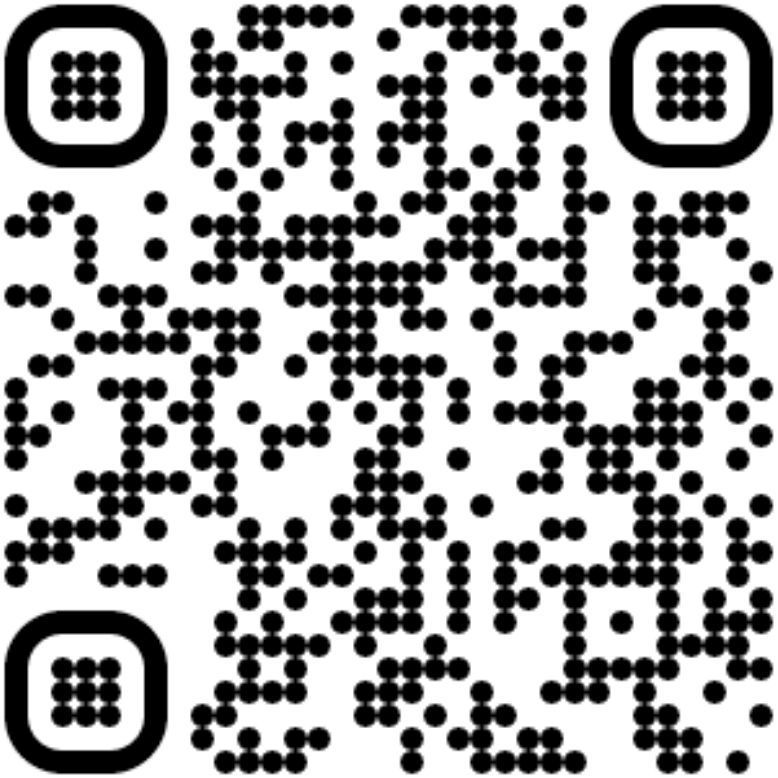
Event Code:



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What is this module about?

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Intended Learning Outcomes

- Demonstrate an understanding and appreciation of recent advances in data science / ML & AI
- Make effective oral and written presentations
- Engage effectively in discussions about recent research in data science

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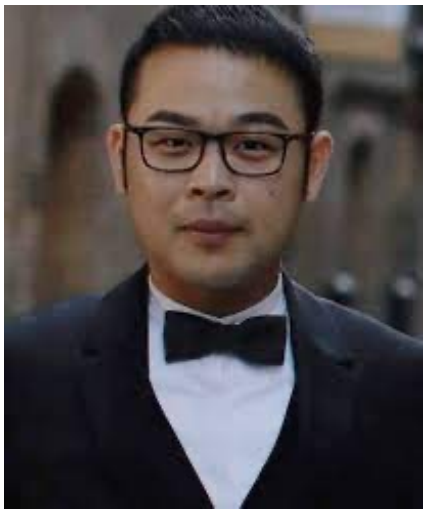
Jinming Duan

- Leveraging prior knowledge such that machine can learn better.
- Will cover some recent advances of the usage of machine (deep) learning in medical imaging.



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Hyung Jin Chang

- Vision-based human body pose, human hand pose, eye gaze, and 6D object pose estimation methods.

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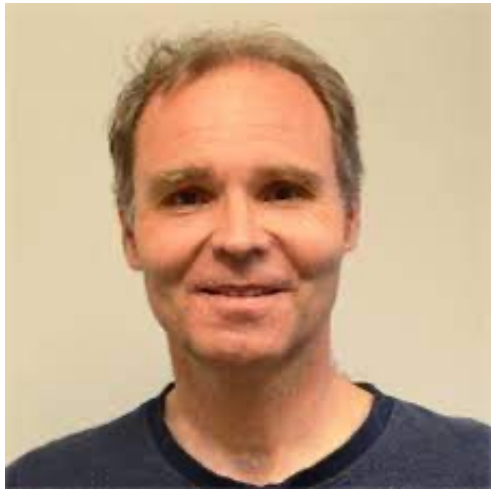
Peter Tino

- Issues that emerged in Machine Learning when the data exhibits temporal dependencies.
- When data cannot be considered in isolation and the order in which the data is presented matters, e.g. stock price prediction



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Alexander Krull

- Concept of 'Denoising in Scientific Imaging,
- As applied in Biomedical Sciences through Fluorescence Microscopy to account for Noise

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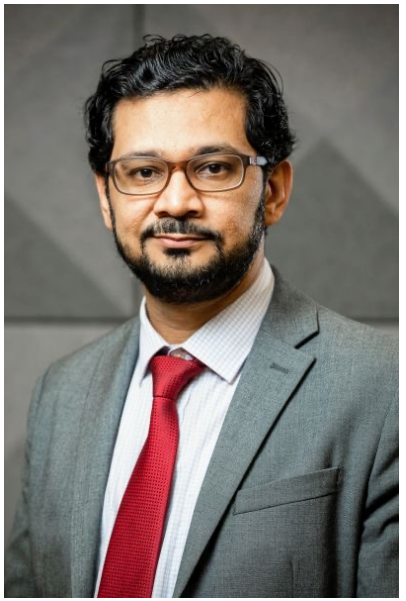
Kashif Rajpoot

- Computational Pathology
  - AI and machine learning algorithms for the study of histological and multi-omic markers of cancer biology,
  - early detection of cancer and stratification of cancer patients in terms of recurrence, progression and response to therapy



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Ales Leaonardis

- Computational Photography
  - Methods for computer vision, object and scene recognition and categorization, and object tracking.
  - Using computing techniques such as artificial intelligence, machine learning to capture images.

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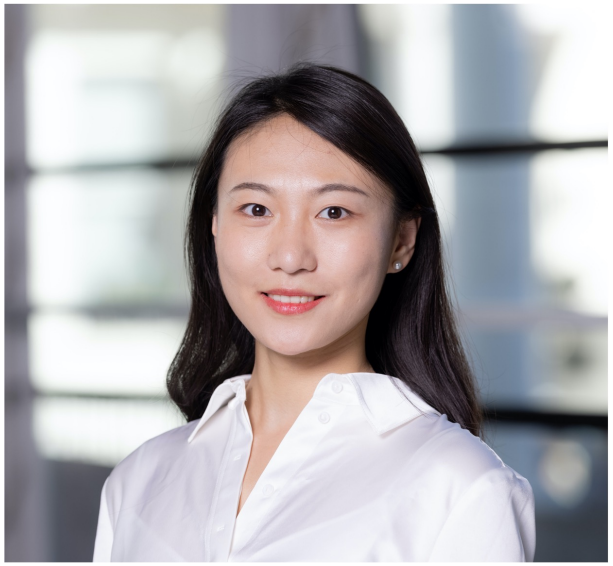
Qingjie Meng

- Domain shift in machine learning
  - Cross-domain image analysis.
  - Implications for medical imaging analysis.
  - Cross-domain ultrasound classification and cross-domain MRI segmentation.



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Resource

- Canvas
  - Check module pages
  - Weekly updates
    - Videos
    - Papers
- If you don’t understand something, contact Hamid and/or attend an office hour.

Assessment

- Formative assessment – no marks, just practice!
  - Weekly Quiz starting Week 2
- Summative assessment – marks count!
  - Mid-Term Assignment, Week 6 (40%)
  - End of Term Assignment, released March 2024
    - Individual recorded video presentation: a ‘critical review’ of an assigned paper/topic (40%)
    - Peer assessment of 5 presentations (10%)
    - Peer-reviewed grade (10%)

Highly Directed Study

- Probability and Neural Nets
  - See Canvas for Slides

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Questions?

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