CAP 5516
Medical Image Computing
(Spring 2022)

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Lecture 15
Course Summary
Great job on the paper presentation!
Final Project Presentation
### Final Project Presentation Schedule

Please write down your name on the selected presentation time slot.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<tbody>
<tr>
<td>4/14</td>
<td>Ilkin Sevgi Isler</td>
<td>Michael Fielder</td>
<td>Jacob O'Quinn</td>
<td>Taojiannan Yang</td>
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<tr>
<td>4/19</td>
<td>Sobha Shanbogue</td>
<td>Ryan Glaspey</td>
<td>Matthew Horvath</td>
<td>Joe Floresi</td>
<td>Zacchaeus Scheffer</td>
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<td>4/21</td>
<td>Joseph Rivera</td>
<td>Crystal Gagne</td>
<td>Nikhil Sreedhar</td>
<td>Md Sanzid Bin</td>
<td>Stephanie Gonzalez</td>
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<tr>
<td>4/28</td>
<td>Sarath Mannam</td>
<td>Wei Fan</td>
<td>Kyle Beggs</td>
<td>Alejandro Zamora</td>
<td>Akashdeep Chakraborty</td>
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Final Project Presentation

• 8 mins for presentation and 5 mins for questions

• A summary of your project (10 – 15 slides)
  – Problem definition, motivation (why it is important)
  – Your approach (make it very clear!)
  – Results and comparison
  – Conclusion
Project Final Report

• You should extend your project milestone to include:
  – The final set of results.
  – Your analysis of those results.
  – Your overall conclusions and findings from the project.

• If you leverage existing source codes, you should
  – Clearly state it in the report
  – Properly credit/cite the original authors (source) in your report and code
  – Identify which part is your own work.
A Brief Summary
Medical Imaging Modality

- **CT** (Computer Tomography)
- **MRI** (Magnetic Resonance Imaging)
- **Ultrasound**
- **X-ray**
- **Nuclear medicine imaging** (including positron-emission tomography (PET))

...
Deep Learning (DL) for Medical Image Computing (MIC)

- Deep Learning Introduction (a crash course)
  - Fully Connected Feedforward Network
  - Convolutional Neural Networks (CNNs)
  - CNNs Visual Interpretation
  - Recurrent Neural Networks
  - DL training techniques (data augmentation, regularization, transfer learning, etc.)
Deep Learning (DL) for Medical Image Computing (MIC)

- **DL for MIC**
  - Medical image classification
  - Medical image segmentation
  - GANs for MIC
    - image generation (cross modality), image segmentation, image enhancement, etc.
  - Self-supervised learning
  - Adversarial Robustness
  - Federated Learning and its application in MIC
  - Efficient DL for MIC
    - Efficient network architectures
    - Network pruning
    - Network quantization
    - Knowledge distillation
Medical Imaging with Deep Learning
Zürich, 6 – 8 July 2022

https://2022.midl.io/

https://biomedicalimaging.org/2022/

https://embc.embs.org/2022/
Open Discussion
Final Project

Q&A