

# Week 5: Imaging & Diagnostics [March 1, 2021]

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## 1. KEY QUESTIONS

- How can neural networks accelerate the field of biotechnology?
- What is a convolutional neural network?
- Will neural networks ever be able to independently make medical diagnoses?
- What are the stakes of a neural network being wrong?
- How do neural networks evolve as they get trained on more data?
- How do we mitigate biases when training neural networks?

## 2. BRIEF AGENDA

- Guest Lecture by Fiorenzo Omenetto
- Announcements
- Break
- Neural Networks Wrap Up
- Imaging & Diagnostics

## 3. TIMELINE

- **5:50pm - 20 minutes:** Let folks trickle in and set up projector / screen-share for Zoomers  
*Sejal will introduce Fio*
- **6:10pm - 1 hour:** Guest lecture on AI in imaging / diagnostics by Fiorenzo Omenetto  
*Assuming Soha will leave 10 minutes for questions at the end*
- **7:10pm - 15 minutes:** Break for snacks / dinner and socialization
- **7:25pm - 5 minutes:** Announcements / administrative things  
*Sejal leads, Sook-Hee oversees and helps get Zoomers checked back in*
- **7:30pm - 5 minutes:** Recap neural networks (interactive)  
*Sook-Hee will lead discussion: What's something you recall about neural networks from last week?*
- **7:35pm - 5 minutes:** Neural Networks Review  
*Sook-Hee leads, Sejal oversees*
- **7:40pm - 5 minutes:** Neural Networks Takeaways  
*Sejal discusses overfitting and NNs learning from their mistakes, Sook-Hee oversees*
- **7:45pm - 10 minutes:** Introduction to Convolutional Neural Networks  
*Sook-Hee leads, Sejal oversees*
- **7:55pm - 10 minutes:** Activity: Visualizing an NN  
*Sejal introduces, both circulate*
- **8:05pm - 5 minutes:** Introduction to Medical Imaging  
*Sejal leads, Sook-Hee oversees*

- **8:10pm - 5 minutes:** Eyes of Watson Video  
*Sook-Hee leads, Sejal oversees*
- **8:15pm - 5 minutes:** TensorFlow Computer Vision Video  
*Sejal leads, Sook-Hee oversees*
- **8:20pm - 2 minutes:** Verbally explain the homework >> class dismissed  
*Sejal leads, Sook-Hee oversees*