

Montreal, July 8-12

# DLMI2024

## Summer School on Deep Learning for Medical Imaging 5<sup>th</sup> edition



Centre hospitalier  
universitaire  
de Sherbrooke



# Welcome message

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The Organizers and Sponsors welcome you to the fifth edition of the Summer School on Deep Learning for Medical Imaging (DLMI)

We hope you will enjoy the event and your stay in Montreal

## Gold Sponsors



Centre hospitalier  
universitaire  
de Sherbrooke



## Silver Sponsors



Université de  
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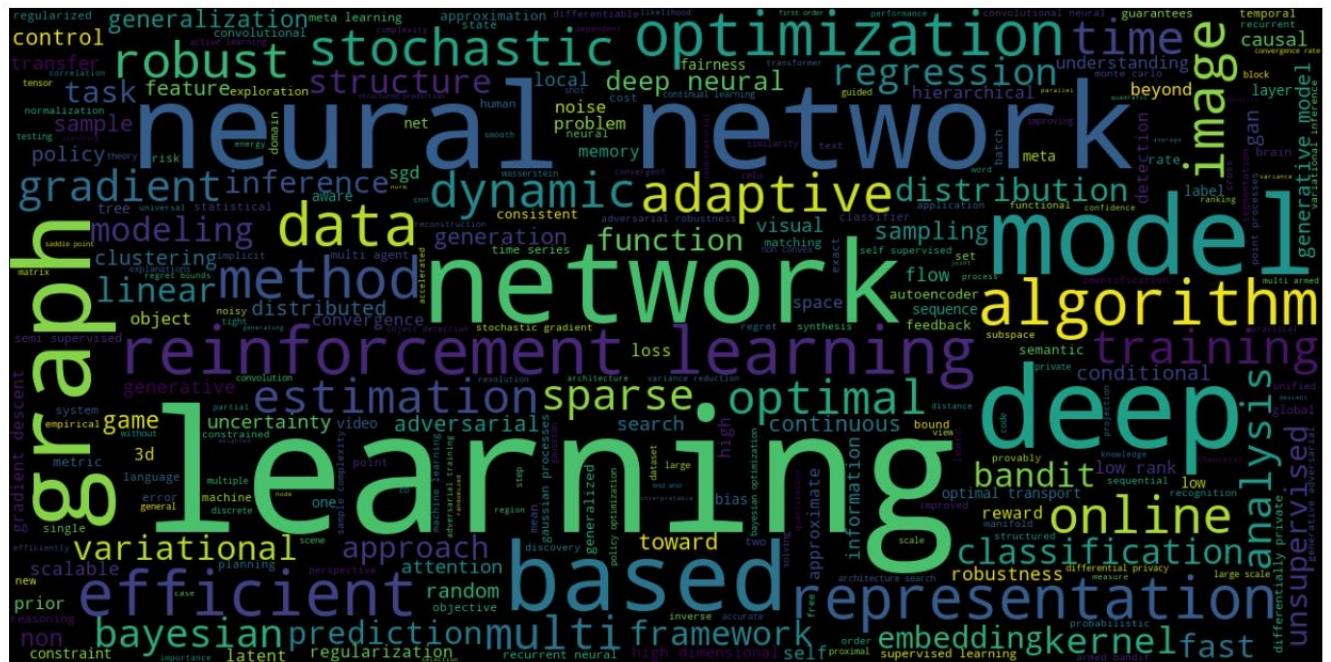
## Bronze Sponsors

Centre d'imagerie moléculaire de  
Sherbrooke (CIMS)

# Introduction

# Why the Summer School ?

- The AI field is becoming more and more complex
  - How to navigate in this jungle ?

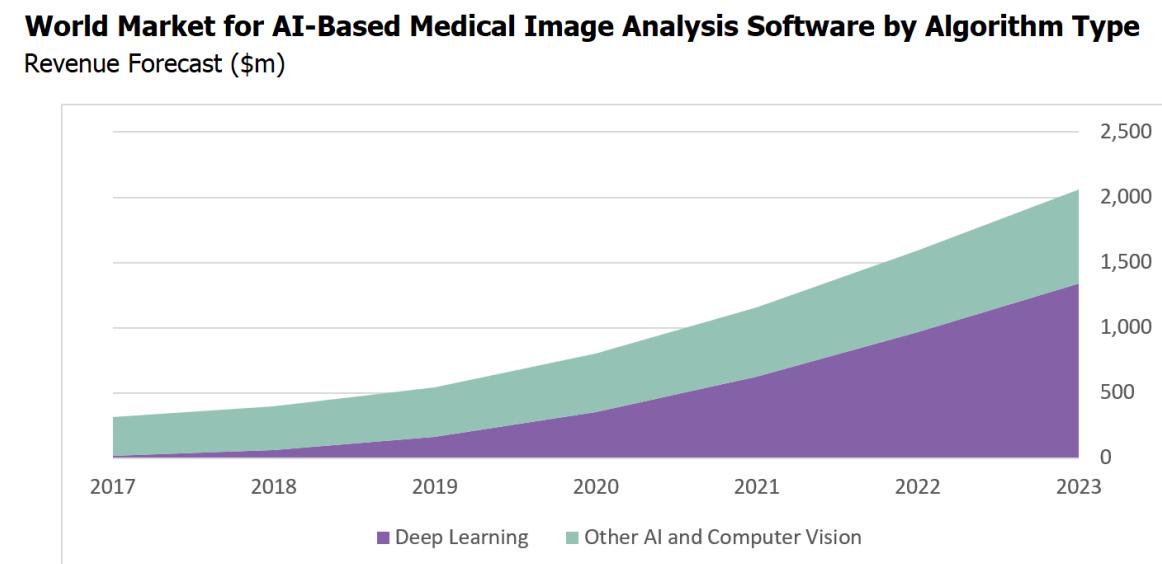
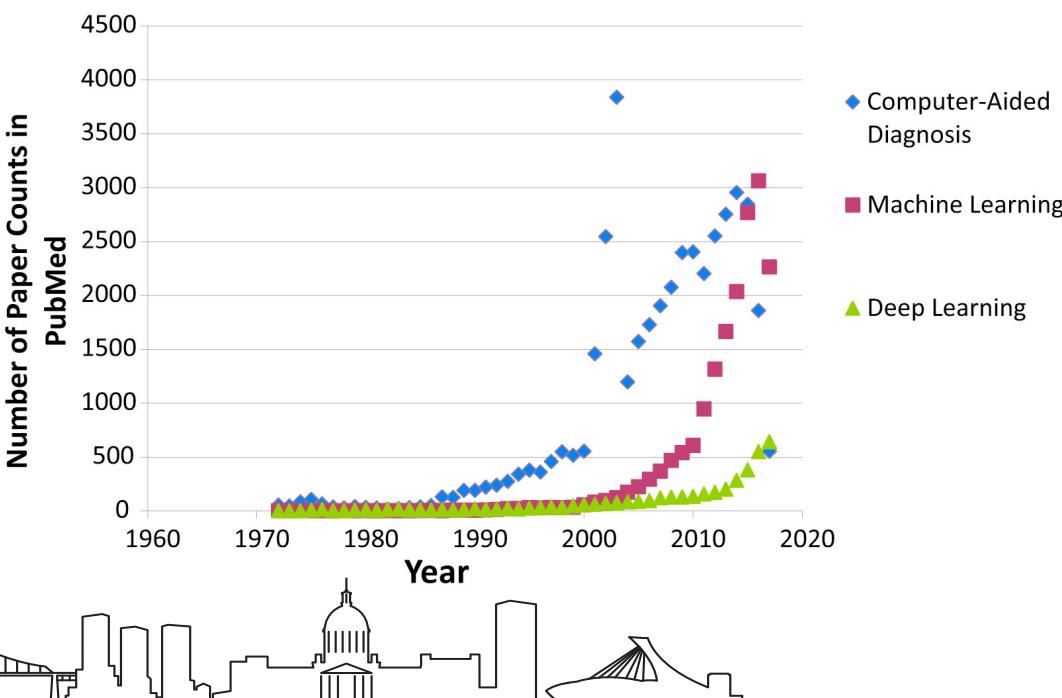


# Introduction

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## Why the Summer School ?

- AI and deep learning have become an essential part of medical imaging



Source: Signify Research

Jul-18

# Introduction

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## What will I learn ?

### Basics of deep learning:

- **Parts 1-2:** Perceptron and MLP, stochastic gradient descent, learning rate, logistic regression, activation function, regularization (L1/L2/dropout/early stopping), etc.
- **Part 3:** Weights initialization, backward propagation, batch size, convolution neural nets (CNN), pooling, etc.



Pierre-Marc Jodoin



Christian Desrosiers



# Introduction

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## What will I learn ?

### Advanced concepts in deep learning 1:

- Recurrent neural networks (RNNs), Attention, Transformers, ViT, etc.



Nicolas Thome

### Advanced concepts in deep learning 2:

- Foundation models, language-image pre-training, parameter efficient fine-tuning, prompt learning.



Jose Dolz



# Introduction

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## What will I learn ?

### Key topics in medical imaging:

1. CNN architectures and applications
2. Generative and adversarial methods
3. Uncertainty and explainability
4. Typical medical imaging issues
5. Semi and weakly supervised deep learning
6. Open source frameworks (MONAI)



Michaël Sdika



Mohammadhadi Shateri



Mohammad Havaei



Jose Dolz



Christian Desrosiers



Eric Kerfoot



# Introduction

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## What will I learn ?

### Round table:

- What are the challenges for AI to break into clinic?

Moderator



Rola Harmouche

Panelists



Sylvain Bouix



Laurent Létourneau-Guillon



Nicolas Thome



Hadi Chakor



# Introduction

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**How to apply these concepts ?**

**Four hands-on tutorials:**

1. Classification from machine learning to deep learning
2. Segmentation using deep learning
3. Variational Autoencoder
4. Foundation models



SaturnCloud



TensorFlow



# Introduction

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## Meeting other participants

**Poster session:**

Tuesday 16h30 - 18h00, Outside this auditorium

**Setup your poster early on ANY available stand**

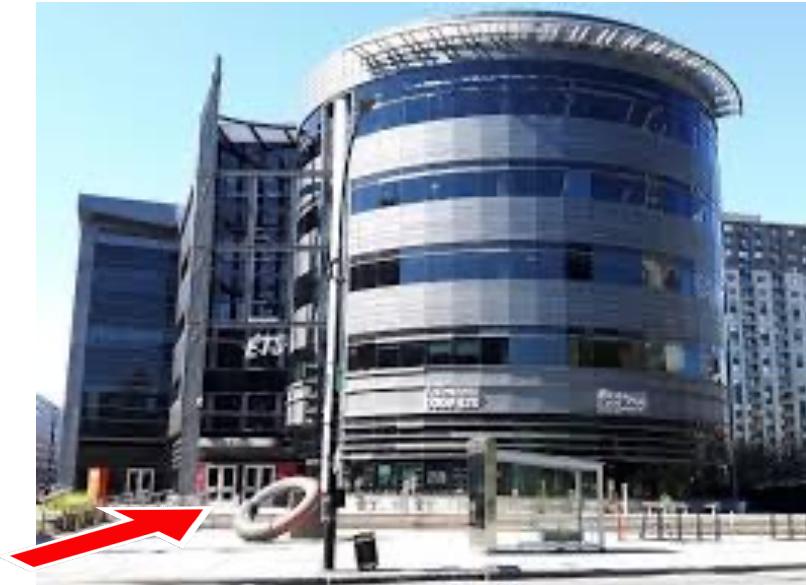


# Introduction

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**Having fun is also important...**

**Cocktail reception: Tonight 17h30, ÉTS Pub located in ÉTS building B – ground floor**



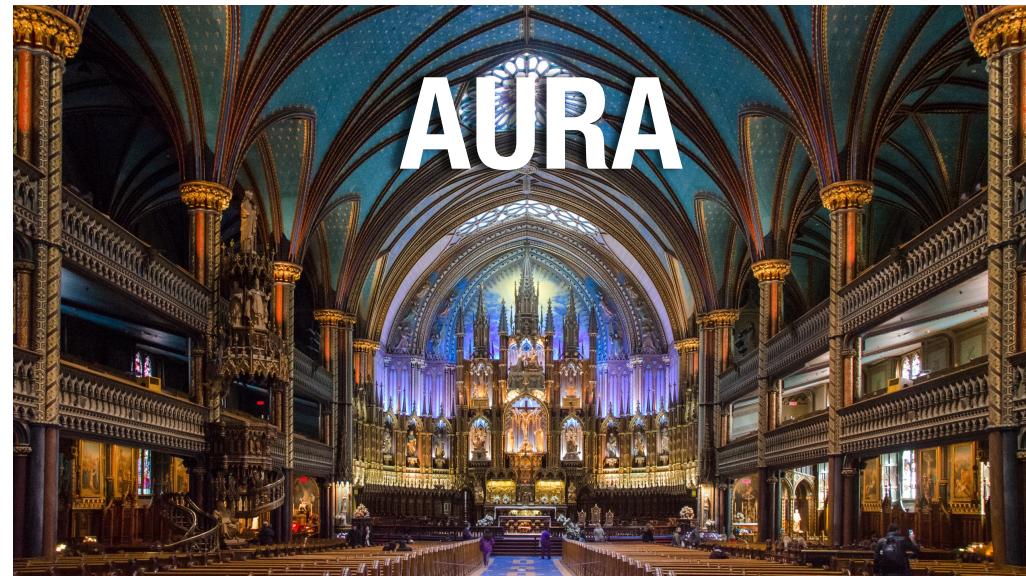
**Bring your drink coupons**

# Introduction

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**Having fun is also important...**

**Social Event: Wednesday 18h00, Notre-Dame Basilica (Old Montreal)**



# Introduction

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**Having fun is also important...**

**Banquet dinner: Thursday 18h00, ÉTS building E (*turn right at top of stairs*)**



# Practical information

## Campus map



**Salle Vidéotron (2<sup>nd</sup> floor)**  
Thursday's Banquet dinner  
**Computer labs (4<sup>th</sup> floor)**  
Hands-on tutorials

**ÉTS Pub (1<sup>st</sup> floor)**  
Tonight's Cocktail  
**Computer labs (1<sup>st</sup> floor)**  
Hands-on tutorials

**Auditorium (here)**  
Talks, coffee breaks, posters (outside)  
**Cafetaria (ground floor)**  
Lunch  
**Computer labs (3<sup>rd</sup> floor)**  
Hands-on tutorials



# Practical information

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## Wi-Fi anywhere on campus

Network: **ETS-Invites**

Login: **wifi-even@etsmtl.ca**

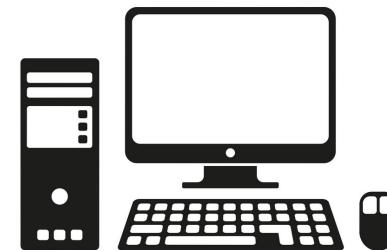
Password: **Eve-2020**



## No laptop ? No problem !

Use the same login on any PC in the labs

*See booklet for more information*



# Practical information

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## Hands-on sessions

Held simultaneously in two different computer labs:

**Sessions 1, 4** : Rooms A-3220 and A-3230

**Session 2** : Rooms E-4021 and E-4022

**Session 3** : Rooms E-4021 and B-2210

You can go to any of the two rooms, we will then assign you to a desk based on available space

**Follow signs to find rooms**



# Practical information

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## Hands-on material

Documents and videos can be found here:

URL : <https://jodoin.github.io/dlmi2024/>

Password : **dlmi2024**

## Before hands-on:

- Create a Saturn account (*see web page*)
- Review the material



# Practical information

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## Breakfast and coffee breaks outside the auditorium

- Light breakfast between 8h30 and 9h00
- Coffee breaks at 10h30 and 15h



## Lunch at the ÉTS cafeteria

- Usually between 12h30 and 14h
- Bring your meal coupons (one per day)

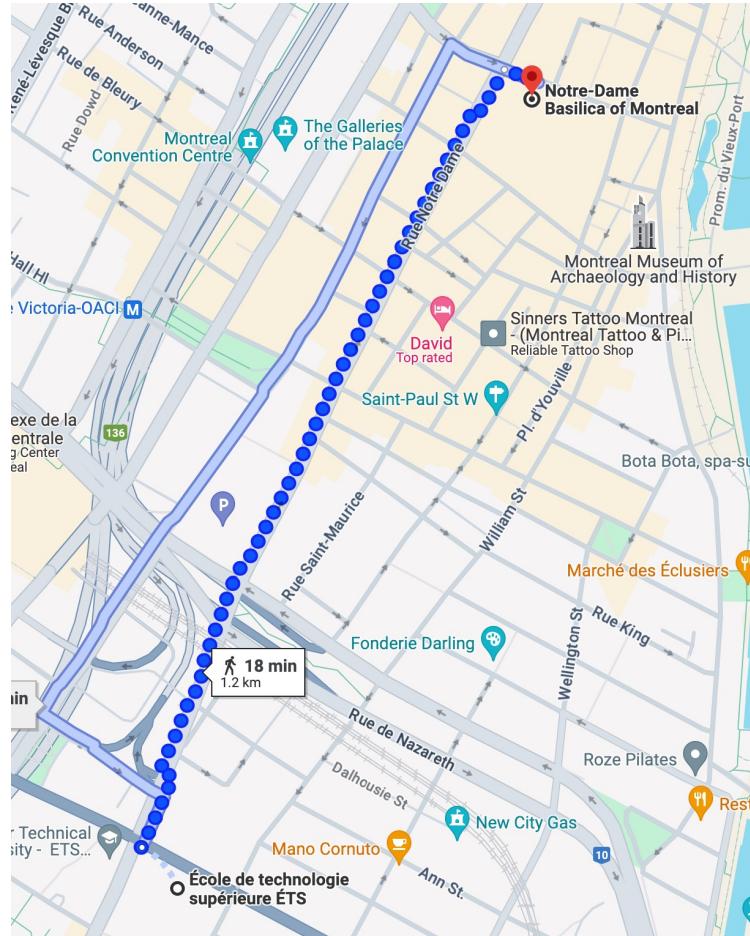


# Practical information

Going to the social event  
on Wednesday

*(Notre-Dame basilica)*

See map in the booklet:



A walking group will leave from the main entrance of this building at **17h15**

Feel free to join !



Montreal, July 8-12

# DLMI2024

Thanks for listening

Have a great time !



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universitaire  
de Sherbrooke



LABEX  
PRIMES  
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