

DLM125	Monday 21	Tuesday 22	Wednesday 23	Thursday 24	Friday 25
8h45-9h00	Welcome Session				
9h00-10h30	Basics in deep learning 1 (Christian Desrosiers/Pierre-Marc Jodoin) Perceptron and multi-layer perceptron, stochastic gradient descent, learning rate, logistic regression, activation function, regularization (L1/L2/dropout/early stopping), etc	Convolutional neural networks (Michael Sdika) Common CNN architectures for classification (VGGNet, ResNet, ...) and localization (FasterRCNN, Yolo) and segmentation (encoder-Decoder, U-Net, ENet, ...)	Generative, auto encoders and adversarial methods for medical imaging (Olivier Bernard /Pierre-Marc Jodoin) Autoencoders, variational autoencoders, (Olivier) GANs, CycleGAN and their training (Christian)	Advanced concepts in deep learning 2 (Nathan Painchaud) attention, transformers (ViT, CCT, ...)	Typical medical imaging issues (Ninon Burgos) Domain adaptation, privacy protection and federated learning, common pitfalls, incomplete data,
11h00-12h30	Basics in deep learning 2 (Christian Desrosiers/Pierre-Marc Jodoin) Perceptron and multi-layer perceptron, stochastic gradient descent, learning rate, logistic regression, activation function, regularization (L1/L2/dropout/early stopping), etc.	Uncertainty and explainability (Michael Sdika) Quality, uncertainty, calibration, explainability.	Deep learning for image reconstruction (Nicolas Ducros) Plug-and-play and unrolled methods for image reconstruction problems (e.g., CT, MR, PET)	Round table : topic HAX (Agnès Vernet)	- Introduction to MONAI (kitWare Lyon /TBC) - Closing session (Thomas Grenier)
12h30-14h00					
14h00-15h30	Basics in deep learning 3 (Christian Desrosiers/Pierre-Marc Jodoin) Weights initialization, forward and backward propagation, batch size, convolution neural nets (CNN), feature maps, pooling, pretraining and transfer learning, applications	Weakly supervised deep learning (Christian Desrosiers) Weakly supervised segmentation, constrained CNN losses, semantic segmentation, semi-supervised learning	Hands-on session 2: Segmentation with UNet (Fabien Millioz, Thomas Grenier) Datasets, Data augmentation, Unet and its hyperparameters, training curves	Hands-on session 3: Variational Autoencoder (Pierre-Marc Jodoin, Nathan Painchaud) Auto-encoders, convolutional auto-encoders, variational auto-encoders, latent spaces	Hands-on session 4: Deep learning for image reconstruction (Nicolas Ducros)
16h00-18h00	Hands-on session 1: Classification MLP (Thomas Grenier, Fabien Millioz) Classification from machine learning to MLP	Hands-on session 1: Classification (Thomas Grenier, Fabien Millioz) Deep learning classification with CNN and introduction to explainability and knowledge distillation			