

DAY 1 | Introduction to Radiomics and LIFEx | Producing (radiomic) features

30 min	09:00	Basics – All Faculty Welcome, agenda, brief introduction
45 min	09:30	A brief introduction to radiomics – I Buvat (Institut Curie)
60 min	10:15	Research Planning – I Buvat (Institut Curie) <ul style="list-style-type: none"> - Step-by-step approach to building hypothesis, sorting out data and data quality, etc. - Guidelines for properly designing / reporting a radiomic study
30 min	11:15	Break
60 min	11:45	Hands on LIFEx – I Buvat, F Orlhac, C Nioche, N Hovhannisyan (Institut Curie) <ul style="list-style-type: none"> - Installing www.lifexsoft.org - Reading and manipulating medical images in LIFEx - Segmenting images in LIFEx - Manipulating regions of interest in LIFEx
75 min	12:45	Break (Lunch)
60 min	14:00	Radiomics Feature extraction – F Orlhac (Institut Curie) <ul style="list-style-type: none"> - Radiomics and feature extraction - Settings for feature calculation (quantization step, spatial resampling, filters) - Feature correlation
90 min	15:00	Hands on LIFEx – I Buvat, F Orlhac, C Nioche, N Hovhannisyan (Institut Curie) <ul style="list-style-type: none"> - Image resampling - Extracting radiomic features - Inspecting / interpreting feature values
30 min	16:30	Break
60 min	17:00	Presentation of the participant projects I (5 min per participant) <ul style="list-style-type: none"> - Objectives - Data available - Annotations that are needed - Expected performance compared to SOTA
	19:00	Social dinner

DAY 2 | Automating feature extraction | feature harmonization

30 min	09:00	Recap Day 1 Interactive QA
45 min	09:30	Advanced features - Scripting in LIFEx – N Hovhannisyan (Institut Curie) <ul style="list-style-type: none"> - Filtering for advanced feature calculation - Principle of scripts - Examples
45 min	10:15	Hands on LIFEx – I Buvat, F Orlhac, C Nioche, N Hovhannisyan (Institut Curie) <ul style="list-style-type: none"> - Calculating advanced features - Scripting for automated calculation of features on a series of images
30 min	11:00	Break
60 min	11:30	Reproducibility of radiomic features – need for harmonization – F Orlhac (Institut Curie) <ul style="list-style-type: none"> - The challenge of reproducible radiomics - Center and population effect - Solution for feature harmonization and ComBat
75 min	12:30	Break (Lunch)
60 min	13:45	Hands on feature harmonization – I Buvat, F Orlhac, C Nioche, N Hovhannisyan (Institut Curie) <ul style="list-style-type: none"> - Characterizing the center effect - Harmonization using ComBat
30 min	14:45	Image annotation – C Nioche (Institut Curie) <ul style="list-style-type: none"> - The different types of annotation - Building an annotation interface - Exploiting the annotations
30 min	15:15	Break
60 min	15:45	Presentation of the participant projects II (5 min per participant) <ul style="list-style-type: none"> - Objectives - Data available - Annotations that are needed - Expected performance compared to SOTA
60 min	16:45	Hands on image annotation – I Buvat, F Orlhac, C Nioche, N Hovhannisyan (Institut Curie) <ul style="list-style-type: none"> - Building the annotation interface associated with your project - Image annotation

DAY 3 | Model building | Summary and Q&A

30 min	09:00	Recap Day 2 Interactive QA
60 min	09:30	Building a radiomic model – J Mullaert (Institut Curie) <ul style="list-style-type: none"> - The task: classification or prediction - Classification vs survival models - Feature selection - Data leakage
60 min	10:30	Model evaluation – J Mullaert (Institut Curie) <ul style="list-style-type: none"> - Metrics - Cross-validation strategies - External validation
30 min	11:30	Break
60 min	12:00	Hands on model building – J Mullaert, I Buvat, F Orlhac, C Nioche, N Hovhannisyan (Institut Curie) <ul style="list-style-type: none"> - Building a model - Evaluating its performance
75 min	13:00	Break (Lunch)
30 min	14:15	Model interpretation – I Buvat (Institut Curie) <ul style="list-style-type: none"> - CAM, SHAP, and other tools - Chasing the Clever Hans effect - Turning a model into a verifiable assumption
45 min	14:45	Reporting a radiomic study – I Buvat (Institut Curie) <ul style="list-style-type: none"> - Tools to guide the reporting - Assigning a quality index to a radiomic study
30 min	15:30	Break
90 min	16:00	Hands on model building, interpretation and reporting – I Buvat, F Orlhac, C Nioche, N Hovhannisyan (Institut Curie) <ul style="list-style-type: none"> - Interpreting models - Checking that the interpretation is correct - Evaluating the quality of a radiomic study using an on-line tool
30 min	17:30	Summary, general remarks and assessment of the training session