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ARTIFICIAL INTELLIGENCE / RADIOLOGICS AND ARTIFICIAL INTELLIGENCE IN DIAGNOSIS (RAID)



Advanced
Health
Education

by NOVA Medical School



COURSE COORDINATORS >> Maria Margarida Ribeiro, Life Sci, PhD
Luís Carvalho Freire, Bio Phys, PhD
André Cacito, Rad Tech, Lic

COURSE PRESENTATION

The integration of radiomics and artificial intelligence (AI) into current clinical practice offers wide potential in the development of new diagnostic and treatment approaches.

This course is designed to provide participants with an in-depth understanding of the principles of radiomics, advanced imaging technologies and the implementation of AI-based tools.

By combining theoretical knowledge with practical applications, this course aims to provide clinical professionals with the knowledge and skills to, from the huge variety and quantity of radiomics data, be able to use the best AI techniques for accurate detection of diseases and therapy assessment.

LEARNING OBJECTIVES

- >> Equip students with a comprehensive understanding of the mathematical and statistical principles subjacent to Radiomics and Artificial Intelligence (R&AI)
- >> Enable students to understand the handling of relevant data to radiomics, ensuring they are well-prepared to work with complex medical datasets.
- >> Introduce students to fundamental programming concepts, enabling them to implement and develop algorithms for radiomics and AI applications.
- >> Develop a comprehensive understanding of machine learning and deep learning techniques, empowering students to leverage these advanced methodologies in radiomics and AI research.
- >> Encourage students to apply their theoretical knowledge practically, with a specific focus on real-world applications such as Medical Diagnosis, Segmentation, Oncologic Assessment, and Precision Medicine.
- >> Instruct students on integrating radiomics techniques into the creation of nomograms, enhancing the potential for personalized medical interventions and treatment plans.
- >> Promote the exchange of experiences, doubts, ideas on all the topics covered in this course.
- >> Guide students in developing tailored solutions for the implementation of radiomics methodologies in diagnostic procedures (in the final work).

KNOWLEDGE AND SKILLS TO DEVELOP:

As a **Professional from the Clinical Areas**, doing this course, you will develop the skills and knowledge to:

- Understand of the mathematical and statistical principles subjacent to Radiomics and Artificial Intelligence (R&AI);
- Knowing fundamental programming concepts, enabling you to implement and develop algorithms for radiomics and AI applications, that you can use for clinical trials, essays, Master's Thesis, PhD final Thesis, other research purposes;
- Understand of machine learning and deep learning concepts, empowering you to leverage these advanced methodologies in radiomics and AI clinical research;
- Applying your theoretical knowledge practically, with a specific focus on real world applications such as Medical Diagnosis, Segmentation, Oncologic Assessment, Biomarkers and Precision Medicine;
- Understand of the ethical considerations and privacy regulations surrounding the use of AI in healthcare.

As a **Health Engineer or Technologist**, doing this course you will develop the skills and knowledge to:

- Understand of the mathematical and statistical principles subjacent to Radiomics and Artificial Intelligence (R&AI);
- Knowing fundamental programming concepts, enabling you to implement and develop algorithms for radiomics and AI applications:
- Understand of machine learning and deep learning techniques, empowering you to leverage these advanced methodologies in radiomics and AI research;
- Applying your theoretical knowledge practically, with a specific focus on real world applications such as Medical Diagnosis, Segmentation, Oncologic Assessment, Biomarkers and Precision Medicine;
- Analyzing large datasets using statistical methods and visualize data to uncover insights that can inform AI model development and healthcare decision-making.

As a **Health Data Scientist**, doing this course, you will develop the skills and knowledge to:

- Handling programming concepts, enabling you to implement and develop algorithms for radiomics and AI applications, that you can use for clinical trials, essays, Master's Thesis, PhD final Thesis, other research purposes;
- Having familiarity with healthcare data standards and medical terminologies;
- Analyzing large datasets using statistical methods and visualize data to uncover insights that can inform AI model and neural networks development and healthcare decision-making;
- Managing AI projects from conception through deployment, including defining project goals, selecting appropriate AI technologies, training models, validating performance, and integrating AI solutions into healthcare environments;
- Developing technological tailored solutions for the implementation of radiomics methodologies in diagnostic procedures improving the added value in health settings.

TARGET AUDIENCE

Professionals in the following areas:

- Health Technologies and Engineering
- Clinic and Life Sciences
- Health Data Sciences

ATTENDANCE REQUIREMENTS

For attendance certification as well as awarding CME credits and/or ECTS it is mandatory to complete:

- >>80% attendance
- >>Evaluation

MAX. ATTENDEES >>

30

DURATION >>

40 HOURS

ADMISSION CRITERIA

>>CV

PROGRAMME

2025 / JANUARY

JAN 13th

8:00 am – 6:00 pm

Location: AHED – Health Campus 

Mathematical Models in R & AI

- >> Introduction to Radiomics and AI
- >> Bayes Rule
- >> Dimensionality problem
- >> AI metrics

Practical Exercises

Statistics in R & AI

- >> Descriptive statistics and data visualization
- >> Hypothesis testing and statistical tests
- >> Multiple tests and corrections

Practical Exercises

JAN 20th

8:00 am – 6:00 pm

Location: AHED – Health Campus 

Data Processing

- >> Data structures
- >> Programming skills in Python and Excel
- >> Practical work in Python and Excel

Practical Exercises

PROGRAMME

2025 / JANUARY & FEBRUARY

JAN 27th

8:00 am – 6:00 pm

Location: AHED – Health Campus 

Machine Learning and Deep Learning

- >> Regression
- >> Decision Trees
- >> Random Forests
- >> Classification
- >> Unsupervised learning
- >> Supervised learning
- >> Deep learning
- >> Data augmentation and cross-validation
- >> Manipulation of Jupiter and Orange software to implement AI

Debate

Practical Exercises

FEB 10th

8:00 am – 6:00 pm

Location: AHED – Health Campus 

Applications – Precision and Personalized Medicine

- >> Quantification, risk and survival estimators
 - Radiomics
 - Biomarkers
 - Uncertainty Analysis
 - Variability
 - Classification and Quantification
 - Automatic online calculators and tables in Radiology
- >> AI applications
 - Applications in orthopedics
 - Fracture recognition
 - Surgical training
 - Robotization
 - Reduction in the rate of neglected fractures
 - Placement of implants and customization of prosthetics

Debate

PROGRAMME

2025 / FEBRUARY

FEB 17th

8:00 am – 6:00 pm

Location: AHED – Health Campus 

AI Applications

- >> Construction and training of models for medical diagnosis
- >> Medical Image Segmentation
- >> Application in pulmonary pathology
- >> Recognition and quantification of nodules, pneumonia, pneumothorax
- >> Discriminates assessment of changes in the pulmonary interstitium
- >> Applications in image processing in the diagnosis of heart diseases
- >> Personalized assessment of obstructive heart disease
- >> Quantitative coronary angiography
- >> Analysis of lipid-rich plaques
- >> Quantification of myocardial perfusion and contribution to personalized treatment plans

Debate

FACULTY

- >> Ana Luísa Vieira, Med Phys, PhD
- >> André Cacito, Rad Tech, Lic
- >> Geoffrey Stenuit, Nucl Phys, PhD
- >> Hugo Ferreira, MD, PhD
- >> Hugo Marques, MD, PhD
- >> Luis Freire, Bio Phys, PhD
- >> Marco Costa, BSc, MBA
- >> Maria Margarida Ribeiro, Life Sci, PhD
- >> Nuno Teixeira, Med Phys, PhD
- >> Sandra Tecelão, Bio Phys, PhD

INSTITUTIONAL PARTNERSHIPS >>



SCIENTIFIC PARTNERSHIPS >>



APPLICATION >>

Deadline: DECEMBER 31st 2024

Fee: 50€

Application fees are non-refundable*

**Secure your spot!
Apply **HERE!****

TUITION FEE >>

950€ (VAT exempted)

INCLUSIONS AND EXCLUSIONS IN PRICE

The price published for this course includes coffee breaks, teaching fees, space rental, certificate of attendance, and materials used during the course. The price of the course doesn't include hotel accommodation, lunches and dinners on course days, nor any other items unless specifically mentioned. Prices of courses published by AHED are exempted of VAT. Other items priced by AHED apart from courses may however include VAT.

APPLICATION, ADMISSION AND REGISTRATION

When applying for a course at AHED - Advanced Health Education, the applicant agrees to subject personal and professional data. This data will be verified and assessed to check that the applicant meets the admission criteria for the specific programme.

Once an application is approved, the participant is admitted and payment of the tuition fee will be required to complete the registration.

COURSE REGISTRATION FEES

The registration stage is considered completed when the total price of the course is received by AHED.

PAYMENT OPTIONS

Payment options for application and registration include credit card (Visa, MasterCard), wire transfer in Euro, and Multibanco.

EARLY BIRD

*Application fees will be discounted from the course price for registrations completed 90 calendar days before the date of the course.

For additional information, please go to in Terms and Conditions at ahed.pt