4th ELO-X Doctoral School – February 5th-9th 2024, Politecnico di Milano, Italy

Week 1 Program for Fellows

Venue: **Sala Conferenze**, Building 20, Dept. of Electronics, Information and Bioengineering (DEIB), via Ponzio 34/5, 20133 Milano

	Monday 5/2/24	Tuesday 6/2/24	Wednesday 7/2/24	Thursday 8/2/24		Friday 9/2/24	Saturday 10/2/24	Sunday 11/2/24
09:00-10:00				Innovation & Entrepreneurship		Seminar A. Bemporad	Social program weekend for ESRs	Social program weekend for ESRs
10:00-11:00	Mini Transformer Course	Mini Transformer Course	Innovation & Entrepreneurship			Poster session & Advisory Board meetings		
11:00-12:00								
12:00-13:00								
13:00-14:30	Lunch break	Lunch break	Lunch break	Lunch break	SB meeting 13:30-14:30	Lunch break		
14:30-15:30	Mini Transformer Course	Mini Transformer Course	Innovation & Entrepreneurship	Seminar A. Ferrara		Poster session & Advisory Board meetings		
15:30-16:30				Social program				
16:30-17:30								
17:30-18:30	Welcome apero							
18:30-19:30								
19:30-20:30								
20:30-21:30								
21:30-22:30								

Week 1 Program for supervisors and advisory board

Thursday 8/2/24
13:30 – 14:30   Supervisory Board meeting*
15:30 – 16:30   Seminar Prof. A. Ferrara
17:30 – 22:30   Social program

Friday 9/2/24
09:00 – 10:00   Seminar Prof. A. Bemporad
10:00 – 17:00   Poster sessions, meetings with fellows and AB members

*Venue for the SB meeting: Sala Seminari N. Schiavoni, Building 20, Dept. of Electronics, Information and Bioengineering (DEIB), via Ponzio 34/5, 20133 Milano (very close to Sala Conferenze)

Week 2 Program

Venue: Sala Seminari N. Schiavoni, Building 20, Dept. of Electronics, Information and Bioengineering (DEIB), via Ponzio 34/5, 20133 Milano
Co-working space will be available for all ESRs at the venue.

Additional Information

Coffee breaks and lunch will be provided for the whole Week 1.

Mini Transformer Course - program

After the seminal work "Attention Is All You Need" Transformers have become the state of the art in NLP tasks, and more recently they are quickly gaining relevance in modeling images too. The course starts from the Transformers' origin and the math behind these models, then it presents the use of Transformers in image classification and other typical computer vision tasks.

Day 1 - 05/02/2024 – Prof. Matteo Matteucci (transformers basics):
- Intro to the course and logistics
- Overview of RNN and their limits
- Seq2Seq models and Attention (neural translation)
- Attention and visualization
- The transformer idea from "attention is all you need"
- The transformer math explained step by step
- Notebook: Transformer in a nutshell

Day 2 - 06/02/2024 – Prof. Giacomo Boracchi (visual transformers)
- Basics on Images, Visual Recognition Problems, CNNs and Latent Representations
- Basics of Vision Transformer (ViT)
- CLIP + applications (e.g., zero shot learning)
- Notebook: Vision Transformer (ViT)

Innovation & entrepreneurship course - Program

Prof. Massimo Colombo

Day 1 – Innovation and industry structure in IT industries

Lesson 1 – Innovation and competition in IT industries, prof. Cristina Rossi Lamastra (1.5 h)

The aim of this lesson is to illustrate the economic concepts that drive the dynamics of innovation and competition in IT-based industries, with special attention being devoted to emergent industry segments (artificial intelligence, advanced robotics, unmanned vehicles, advances air mobility).

Lesson 2 - "Business Models Archetypes in IT Industries: an Introduction with Practical Cases", Prof. Angelo Cavallo (1.5h)

Main constructs and framework of business models in IT industries are introduced in this class. Students will learn about appropriate terminology, meanings, and practical tools that support business model design. Concrete examples and business model archetypes will be presented.

Lesson 3 - "What IT companies look for when hiring IT PhD graduates", HR manager of a prominent IT company (1.5 h, including Q&A)

Day 2 – From science to high-tech entrepreneurship

Lesson 4 - The Journey from Business Model Design to Business Model Validation, prof. Angelo Cavallo (5h)

In this class, students will learn how to move from an initial design to the validation and testing of business models based on a high-tech business idea. Emerging practice-oriented approaches, such as the lean startup, will guide students in logical reasoning and methods that specifically apply to tech businesses. The class includes 2 hours of guided group work activity on how to move from design to the elaboration and testing of the main related business assumptions. Moreover, concrete examples of business experiments for testing and validating a business model will be presented.