



## **Plenary Speech**

### ***Title***

**Artificial Intelligence: Applications, Implications and Speculations**

### ***Speaker***

### ***Abstract***

***Artificial Intelligence: Applications, Implications and Speculations***

### ***Arlindo Oliveira***

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### **Abstract**

Recent advances in the fields of artificial intelligence (AI) and machine learning are revolutionizing our economy and our society. AI-based systems are finding numerous applications in marketing, sales, healthcare, finances, education, transportation, logistics, design, and even in scientific research. In the near future, AI-based systems may replace a significant fraction of human workers in many jobs and functions. Machine learning, a technology that is at the core of recent AI developments, enables computers to learn from experience and opens the way to even more radical changes in the way we

interact with machines. Deep learning, in particular, is enabling us to address new problems in computer vision and human interaction, with many applications in analytics and automation. Recent results obtained with transformer-based vision-language models, convolutional neural networks, deep reinforcement learning, and reverse diffusion have brought this topic to the center of public attention and will have, no doubt, many practical, social, and philosophical impacts in the near future. Next generation AI systems will combine state-of-the-art models with reasoning abilities and agency, achieving or even exceeding human-level performance in many tasks. Many AI companies are now explicitly aiming at developing artificial general intelligence (AGI), creating the prospect of systems as intelligent, powerful, and possibly even as conscious as humans. If they come into existence, what will be the social, legal, and ethical implications?

## ***Short CV***

### **Arlindo de Oliveira – University of Lisbon – IST**

Arlindo Oliveira was born in Angola and has lived in Mozambique, Portugal, Switzerland, the United States (California, Massachusetts and Maryland), Japan and China (Macau). He has a degree in Electrical and Computer Engineering from Instituto Superior Técnico (IST) and a PhD in the same field from the University of California at Berkeley, with a Fulbright scholarship. He was a visiting professor at MIT and a researcher at INESC, CERN, the Electronics Research Laboratory at UC Berkeley, Berkeley Cadence Laboratories and the University of Tokyo.

He was a member of the National Council for Science, Technology and Innovation and of the Advisory Board of the European Parliament's Science and Technology Panel (STOA). He is a Distinguished Professor at IST, president of INESC, visiting professor at the Macau University of Science and Technology, non-executive director of Caixa Geral de Depósitos and a researcher at INESC-ID.

He has published five books, translated into several languages, and hundreds of scientific articles in international journals and conferences in the areas of algorithms, artificial intelligence, machine learning, bioinformatics and computer architecture.

He has been a director of several companies and institutions, as well as president of the Instituto Superior Técnico, INESC-ID and the Portuguese Association for Artificial Intelligence. He is a member of the Lisbon Academy of Sciences, the Academy of Engineering, the IEEE and the ACM. He has received several awards and distinctions, including the Universidade Técnica de Lisboa/Santander award for excellence in research, the GALP/Academia da Engenharia career award and the ACEPI Career Award.