# AI Workshop

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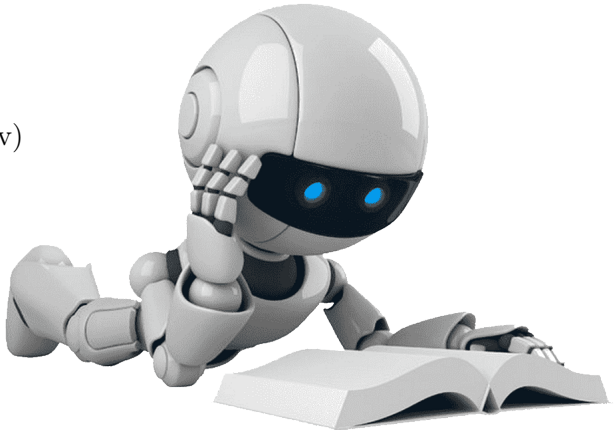



# Hello World!

Welcome to this workshop on artificial intelligence! In the following three days, we will explore both basic and advanced techniques in machine learning, artificial neural networks, and deep neural networks. We will cover the theory behind these methods and provide hands-on practice using the Python programming language.

# About us

**Dr. Fernando Arce-Vega** holds a bachelor's in Electronic Engineering and a master's in Bioelectronics from Cinvestav. He completed his PhD in Computer Science at CIC-IPN and has over 24 certifications in machine learning and deep learning, along with several scientific publications. As a Level 1 member of the National System of Researchers (SNII), he focuses on developing AI algorithms for biosensor optimization and automatic mathematical model generation.

# About Us

**Dr. Wilfrido Gómez-Flores** obtained a BS in Electronics and Communications Engineering from the Technological University of Mexico in 2004, followed by an M.Sc. (2006) and D.Sc. (2009) in Electrical Engineering from Cinvestav. Since 2010, he has been a researcher at Cinvestav Tamaulipas Campus. He has over 100 publications, graduated 14 master's students and four doctoral students, and is a Level 2 in the SNII. His research interests include digital image analysis, pattern recognition, and machine learning.


# Workshop Topics

## Part I: Machine Learning

- What is artificial intelligence?
- Introduction to machine learning
- Basic concepts and definitions
- Supervised learning models
- Unsupervised learning models
- Evaluating classification models

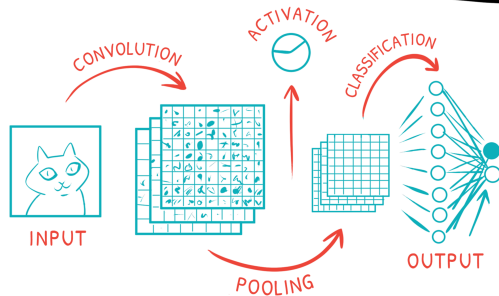
## Part II: Neural Networks

- Biological inspiration
- Gradient descent
- Single-layer neural networks
- Multi-layer perceptron
- SGD and optimizers
- Universal approximation theorem

# Workshop Topics

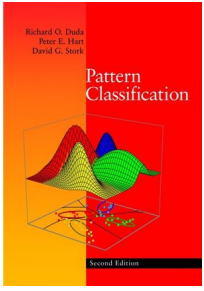
## Part III: Deep Neural Networks

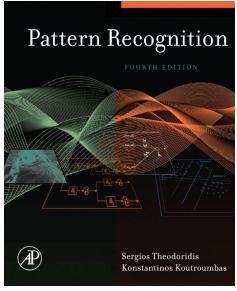
- What is deep learning?
- Convolutional neural networks
- LeNet-5 model
- Pre-trained CNN models
- Instance segmentation
- Convolutional autoencoders
- GRAD-CAM methods

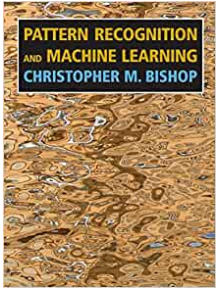


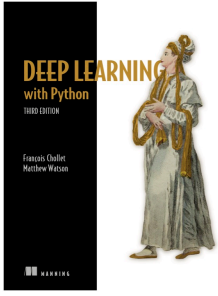

https://cloud.google.com/products/ai/ml-comic-2

# Recommended bibliography




# Course material

https://github.com/fernandoarcevega/AI_Workshop