Artificial Intelligence

CC-421

Books

- AI Crash Course: A fun and hands-on introduction to machine learning, reinforcement learning, deep learning, and artificial intelligence with Python Hadelin de Ponteves. Packt Publishing 2019.
- **Artificial Intelligence: With an Introduction to Machine Learning Richard E. Neapolitan y Xia Jiang.Chapman and Hall/CRC; 2nd Edition 2018.**
- Artificial Intelligence: A Modern Approach (Pearson Series in Artificial Intelligence) Stuart Russell y Peter Norvig.Pearson; 4th Edition 2020
- Introduction to Artificial Intelligence Wolfgang Ertel Second Springer Edition 2017.

Course outline

- Logical Intelligence
  - Chapter 2, 3, 4, 5 Neapolitan
  - Chapter 4 Ertel
  - Chapter 19 Russell-Norvig
- Probabilistic Intelligence
  - Chapter 6, 7, 9, 10. 11, 12 Neapolitan
  - Chapter 7 Ertel
  - Chapter 13, 14 Russell-Norvig
- Emergent Intelligence
  - Chapter 13, 14 Neapolitan
- Language Understanding
  - Chapter 15, 16 Neapolitan
  - Chapter 21, 23, 24 Russell-Norvig

Evaluations

- Homeworks
- Final Examen
- Partial Examen
- Lectures

All assessments are graded, that includes assignments in class.

1 AI-First

AI is capable of transforming industries and opens up a world of new possibilities. What's important is what you do with AI and how you embrace it. To pioneer AI-First innovations advantages: start by exploring how to apply AI in ways never thought of.

The Emerging Rules of the AI-First Era: Search and Learning.

"Search and learning are general purpose methods that continue to scale with increased computation, even as the available computation becomes very great."
— Richard Sutton in The Bitter Lesson

The Best Way Forward For AI

"... so far as I'm concerned, system 1 certainly knows language, understands language... system 2... it does involve certain manipulation of symbols... Gary Marcus ... Gary proposes something that seems very natural... a hybrid architecture... I'm influenced by him... if you look introspectively at the way the mind works... you'd get to that distinction between implicit and explicit... explicit looks like symbols."

— Nobel Laureate Danny Kahneman at AAAI-20 Fireside Chat with Daniel Kahneman https://vimeo.com/390814190

In The Next Decade in AI , Gary Marcus proposes a hybrid, knowledge-driven, reasoning-based approach, centered around cognitive models, that could provide the substrate for a richer, more robust AI than is currently possible The Next Decade in AI: Four Steps Towards Robust Artificial Intelligence

2 Getting Started

Tinker with neural networks in the browser with TensorFlow Playground:
http://playground.tensorflow.org/

- Learn with Google AI https://ai.google/education/.
- Made With ML Topics https://madewithml.com/topics/.
- One Place for Everything AI https://aihub.cloud.google.com/.
- Deep Learning Drizzle https://deep-learning-drizzle.github.io.
- Google Dataset Search https://blog.google/products/search/discovering-millions-datasets-web/.
- AI Literacy for K-12 School Children https://aieducation.mit.edu/resources.
- Learning resources from DeepMind https://deepmind.com/learning-resources.
- Papers With Code https://paperswithcode.com/state-of-the-art.

2 Getting Started

"Data Search has indexed almost 25 million of these datasets , giving you a single place to search for datasets and find links to where the data is."

— Natasha Noy

- The Measure of Intelligence https://arxiv.org/abs/1911.01547

2.1 In the Cloud

Colab, Practical AI, Labs : Introduction to Deep Learning (MIT 6.S191)

- Free GPU compute via Colab https://colab.research.google.com/notebooks/welcome.ipynb.
- Colab can open notebooks directly from GitHub by simply replacing *"http://github.com"* with *"http://colab.research.google.com/github/ "* in the notebook URL.
- Colab Pro https://colab.research.google.com/signup.

2.2 On a Local Machine

JupyterLab is an interactive development environment for working with notebooks, code and data JupyterLab is Ready for Users .

- Install Anaconda https://www.anaconda.com/download/ and launch ‘Anaconda Navigator’
- Update Jupyterlab and launch the application. Under Notebook, click on ‘Python 3’

IDE: Visual Studio Code https://code.visualstudio.com/.