

Foundations of Statistical and Machine Learning for Actuaries -

Artificial Intelligence, Natural Language Processing, and ChatGPT

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Schedule

| Day and Time | Presenter | Topics | Notebooks for Participant Activity |
|-----------------------|-----------|---|--|
| Monday Morning | Jed | Welcome and Foundations Hello to Google Colab | Auto Liability Claims |
| Monday Afternoon | Jed | Classical Regression Modeling | Medical Expenditures (MEPS) |
| | Andrés | Regularization, Resampling, Cross-Validation | Seattle House Sales |
| | Andrés | Classification | Victoria road crash data |
| Tuesday Morning | Andrés | Trees, Boosting, Bagging | |
| Tuesday Afternoon | Jed | Big Data, Dimension Reduction and Non-Supervised Learning | Big Data, Dimension Reduction, and Non-Supervised Learning |
| | Jed | Neural Networks | Seattle House Prices |
| | Jed | Graphic Data Neural Networks | Claim Counts |
| Tuesday 4 pm | Fei | Fei Huang Thoughts on Ethics | MNIST Digits Data |
| Wednesday Morning | Jed | Recurrent Neural Networks, Text Data | Insurer Stock Returns |
| Wednesday After Lunch | Jed | Artificial Intelligence, Natural Language Processing, and ChatGPT | |
| | Dani | Dani Bauer Insights | |
| Wednesday Afternoon | Andrés | Applications and Wrap-Up | |

Tuesday Afternoon 5B.

A Short History of Large Language Models

- 2017: Transformer architecture is proposed based on the self-attention mechanism, which would then become the de facto architecture for most of the subsequent DL systems (Vaswani et al., 2017);
- 2018: GPT-1 (Generative Pre-Trained Transformer) for natural language processing with 117 million parameters, starting a series of advances in the so-called large language models (LLMs);
- 2019: GPT-2 with 1.5 billion parameters;
- 2020: GPT-3 with 175 billion parameters;
- 2022: ChatGPT: a popular chatbot built on GPT-3, astonished the general public, sparking numerous discussions and initiatives centered on AI safety;
- 2023: GPT-4 with ca. 1 trillion parameters (OpenAI, 2023), which allegedly already shows some sparks of artificial general intelligence (AGI) (Bubeck et al., 2023).

Resources For Future Studies

- Sebastian Raschka [Build a Large Language Model \(From Scratch\)](#)
 - [Raschka Teaching Site](#)
- “Speech and Language Processing” by Dan Jurafsky and James H. Martin
 - *Course:* Stanford CS224n - Natural Language Processing with Deep Learning - YouTube Lectures

