

Module 6



Introduction to Generative Models



- Beyond Regression and Classification - Generating tokens and pixels (demo of CoPilot, Lexica)
- Think of parameters as memory of the model (augmented memory and lookup will be introduced later)

Images:

- AutoEncoders, Denoising Autoencoders, VAEs
- GANs
- UNET and Stable Diffusion

Text:

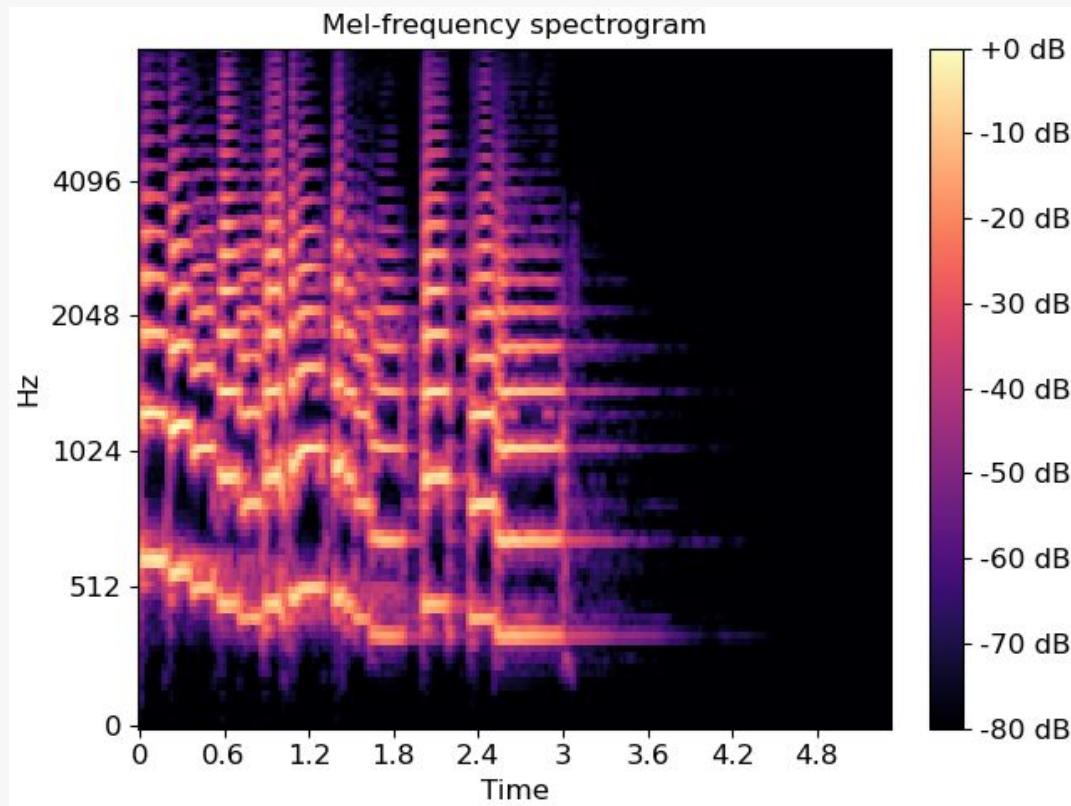
- LLMs

Audio:

- Spectrograms
- Tokens



Audio processing using CNNs



Generative Models

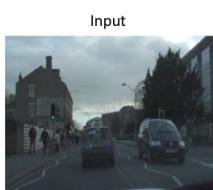
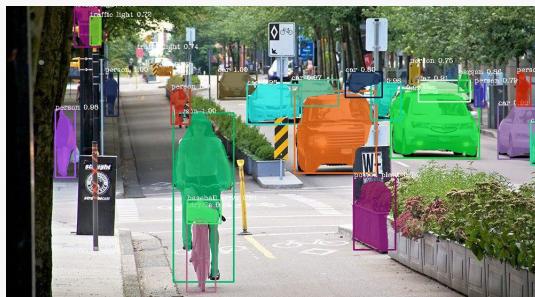
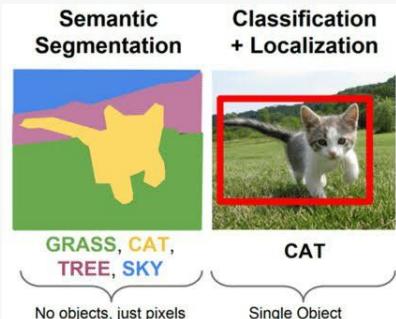


From predictions to creation.

- Create Audio/Speech (AWS Polly/Tacotron)
 - Create Images (DallE/Imagen)
 - Video: <https://youtu.be/cQ54GDm1eL0>
 - Segmentation

< speak >

```
<amazon:effect name="whispered">If you make any noise, </amazon:effect>  
  
she said, <amazon:effect name="whispered">they will hear  
us.</amazon:effect>  
  
</speak>
```



LLM use cases



- Summarization
- Text Expansion
- Question Answering - (Open Domain, Closed Domain)
- Coding
- Named Entity Extraction



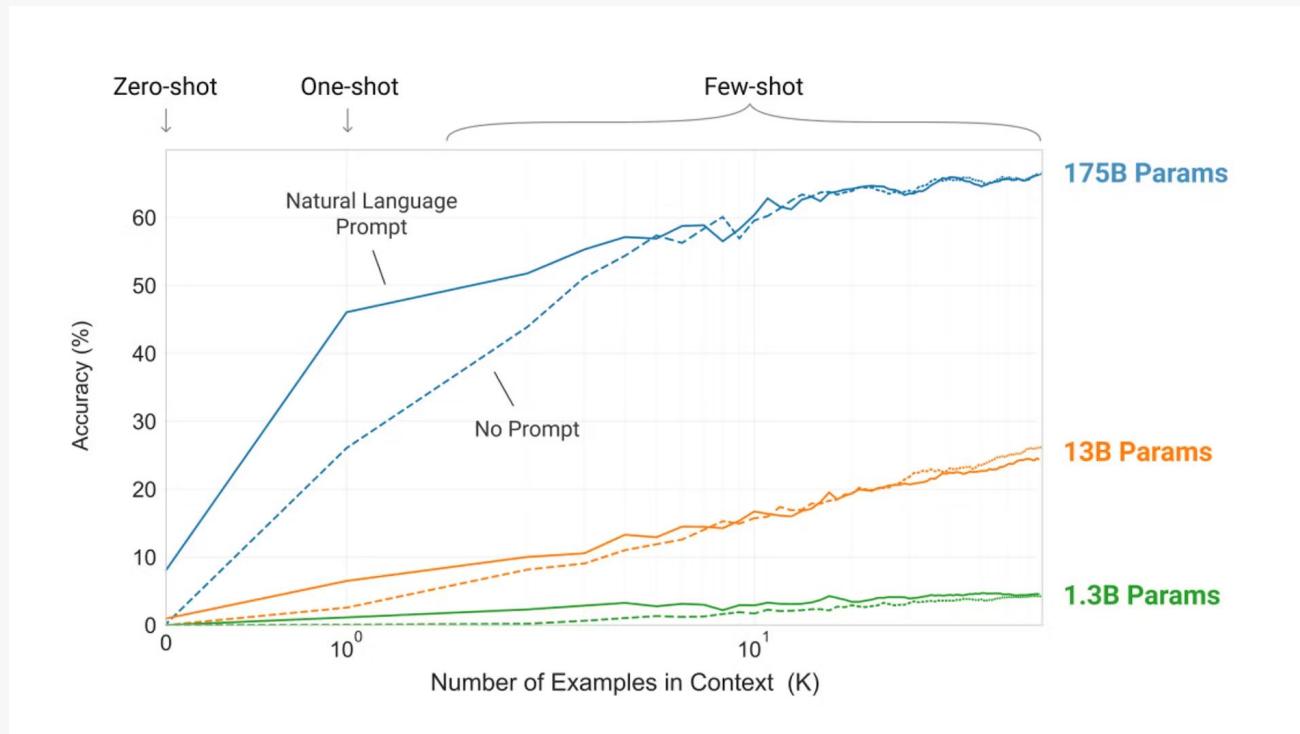
Language Models 101



- Prompts and completions (zero/one/few shot)
- Context window
- Inference Settings (Max tokens, top-p/k, temperature)



Generalization in LLMs



From the [GPT3 paper](#)

Language Models 101



- Atomic Chats - No memory
- Memory as a buffer
- Hallucinations
- Tool Usage



LLM Libraries

- OpenAI
- HuggingFace Transformers
- Langchain
- LLamaIndex

Popular Models:

- GPT4, GPT v3.5 Turbo
- Anthropic Claude2
- Mosaic MPT
- Falcon
- Llama/Llama2



ChatGPT + Langchain intro



Langchain notebook exercises



What Now?



Andrej Karpathy 
@karpathy

...

The hottest new programming language is English

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