CS 579X Natural Language processing
Lecture 1B: A brief intro to neural-based NLP

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You need to believe in neural networks

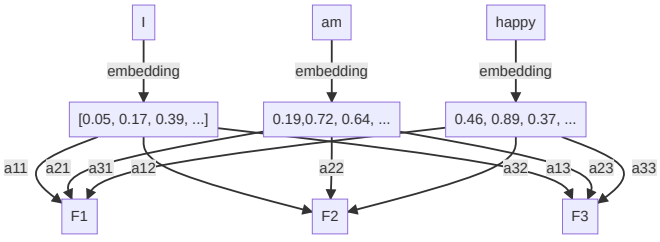
- In the Deep Learning era, NLP is somehow easy.
- Church-Turing thesis, computability
- Neural networks: universal approximation
- Let's see a demo `demo.ipynb`

Ask what you want, neural networks can give you

- Semantic search demo by the instructor
- Masked LM
- DALL-E
- GPT
- coPilot
- OpenAI grade school math

What it takes

- Token-level embedding: string to vectors
- (Self-)Attention (attention weights, aij's in the figure, are floating-point numbers)
- Some complex flow of information (residual, recurrent, normalization, etc.)
- Finally, mapping the neural network output back to string
- Proper training data



Training data is all you needed

- Without training data, how to solve math
- SueNes, sentence deletion vs word deletion