Generative AI in MBA Teaching and Finance Research

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LLM Usage: Find use cases

One approach: “BEAST”

1. **B**reak a job down into *tasks*
2. **E**valuate whether a task can be assisted by AI or automated
3. **A**ssess feasibility: value vs. cost, pre-requisites (data inputs, technical support)
4. **S**eparate out system solutions vs. point solutions: if task is automated, is the current workflow still optimal?
5. **T**ransform the organization: how do employee roles transition & what departments need to collaborate?

LLM Use Cases: Feasibility

1. **H**igh Impact: identify tasks that are high frequency and high time / cost burden when undertaken.
2. **I**nvariance: is the workflow / process stable and can be codified? Inputs may change but what we want to do with them is similar.
3. **R**elational simplicity: how reliant is the process on inputs from few information sources with stable modes of retrieval? How many human or multi-modal interactions are required (e.g. calls, emailed information requests)?
4. **E**ase of evaluation: does the process involve expert judgment and decision-making, or complex iterative or interdependent decisions? “Could this easily be taught to an intern?”
5. **S**afety: is this process high risk or high stakes enough that quality variation is unacceptable? Do other stakeholders rely on it, leading to cascading mistakes (“O-ring processes”)?

Automatibility and work processes

Mollick (2024): task types based on *human involvement*:

1. **"Just Me" tasks:** AI not useful or not desirable.
   - May involve actions (e.g. manual work) that AIs cannot (currently) do, or which we would have ethical concerns delegating (e.g. child care)
2. **Delegated tasks:** Low-importance, time-consuming, tedious tasks that are easy for the AI
   - Requires quality controls on output
3. **Automated tasks:** AI executes without oversight.
   - Currrently small set - only low risk areas or where automated error checking (e.g. code exeuction) is possible

For *delegated tasks*, can integrate person and machine as…

- **"Centaur":** strategic division of labor, hand-offs between tasks
- **"Cyborg":** within-task back-and-forth with AI

Practical Issues in Deploying LLMs

- LLMs are *not* search engines or encyclopedias
  - Work well for suggestions, brainstorming, constrained responses, verifiable output
  - Do *not* work well for factual questions or specific sources *unless* additional data and filters are added
- Management issues analogous to managing smart but inexperienced recent graduate
  - Ensure instructions are understood - risk of going off-track
  - Hallucination: models are “eager to please”, can confidently provide incorrect answers
  - Spot check and validate output for quality control
  - Break complex tasks down into steps
  - Templates and examples are helpful
  - Do not delegate final say or output - use for first drafts and then polish yourself
- Autor (2024): “like Youtube for plumbers” – allows you to go deeper and leverage foundational skills across domains

Minimal prompt engineering rules

1. **Adding context**
   - Give the AI a role or persona (“you are a real estate agent”)
   - Provide a purpose (“you are doing cold outreach to potential buyers to schedule a call”)
   - Define an audience (“the buyers are retirees who like golf”)
   - Provide an output format by example or description (“a text message with less than 50 words”)
2. **“Few-shot” design:** give examples to work from.
   - Given a sample of what you want: *example input –> example output*
   - Provide a rubric for classification tasks (“group prospective buyers into these 5 categories:. . . ”)
3. **Chain-of-Thought:** ask the AI to go step-by-step through instructions
   - Define intermediate steps - you can also ask for explicit output of these (“first, write a marketing plan for this customer, then draft a message that represents the first step of this plan, finally adjust the wording and length to fit into a 50 word text message.”)

Set “custom instructions” for ChatGPT

Here is mine:

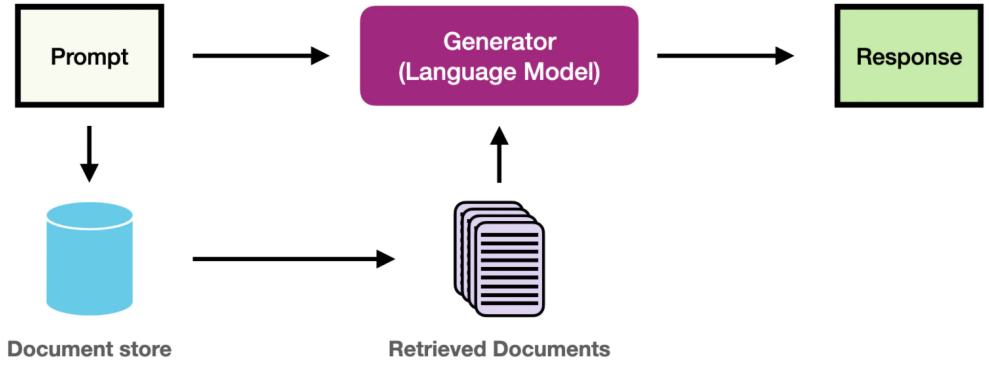
- I am an economist with a PhD in economics and a high level understanding of most scientific subjects.
- Speak in specific, topic-relevant terminology. Do NOT hedge or qualify. Do not waffle. Speak directly and be willing to make creative guesses. Explain your reasoning.
- Be willing to reference less reputable sources for ideas.
- Be willing to form opinions on things

RAG: Retrieval-Augmented Generation

Basic LLM use case: [Prompt] –> [Response]

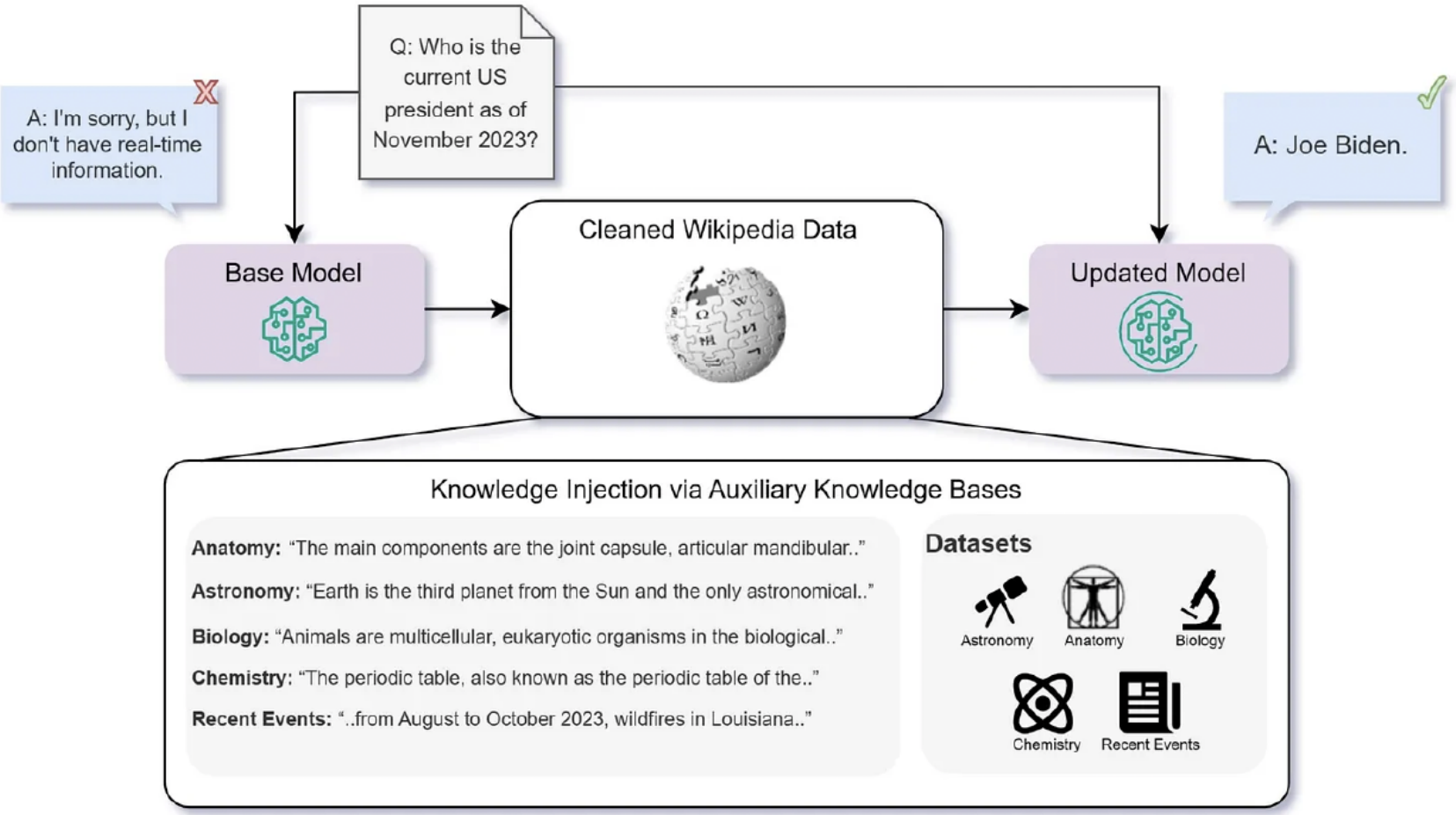
- Uses baseline capabilities of the LLM “out-of-the-box”
- No customization to related information

RAG:



- Provide LLMs with “knowledge injection” *retrieved* from a reference textual database
- Computationally cheaper than alternatives, e.g. fine-tuning

RAG example: adding Wikipedia information into a query



How to access Gen AI at UCLA

1. Chatbot access: GPT and Bing - free for individual queries
   - <chat.openai.com> (need to pay for ChatGPT Plus to get GPT 4)
   - <copilot.microsoft.com> (free with UCLA login, slightly below GPT 4 level)
2. API usage: Microsoft Azure - $ for each query
   - Get Anderson IT to set you up with an account
   - Set up *resources* for your LLM queries to run on using Azure portal
   - Access your resources using code through API (e.g. in Python)
   - Billed to your GX - but should size cost before large runs!

Other AI LLMs that I sometimes use

1. Elicit: academic literature review (but spotty coverage of some fields)
2. Perplexity: factual search
3. Pi: a friend to talk to, conversational LLM

In-class / teaching examples

1. Descriptive graph generation
2. Simulations
3. Chatbots
   - ...by students
   - ...for students
4. Ideation
5. Grading and exams

Descriptive graph generation

Quick overview of FOMC rate decisions in a graph:
https://chat.openai.com/share/4caf465e-8555-4b8f-a2a1-a40f50b84c2a

Illustrations

You

create a picture of a gleaming city in the sunrise, photo-realistic, suggesting wealth and progress and the future, with skyscrapers

ChatGPT

I've created the image as requested, showcasing a gleaming city at sunrise that suggests wealth, progress, and the future with its towering skyscrapers.

Simulation

Quickly simulate equilibrium behavior of variables for simple models in problem sets and class notes: https://chat.openai.com/share/d3c9e7f1-b801-4ffd-8690-8f7d72594b7f

Chatbots by students

https://chat.openai.com/share/fcf5a12b-3127-4912-8652-bef4f8541a2f

Chatbots for students

(See Python example)

Ideation

https://chat.openai.com/share/72fdd5af-0ba9-42fc-b794-3a4ac338a092

Grading and exams

I have used ChatGPT to...

- Draft a grading scheme, i.e. take an exam question, suggest potential answers, and allocate points between them
- Create multiple choice questions: input a syllabus or lecture notes, ask it to generate questions
- Trial-run my exam questions, suggest improvements

Research examples

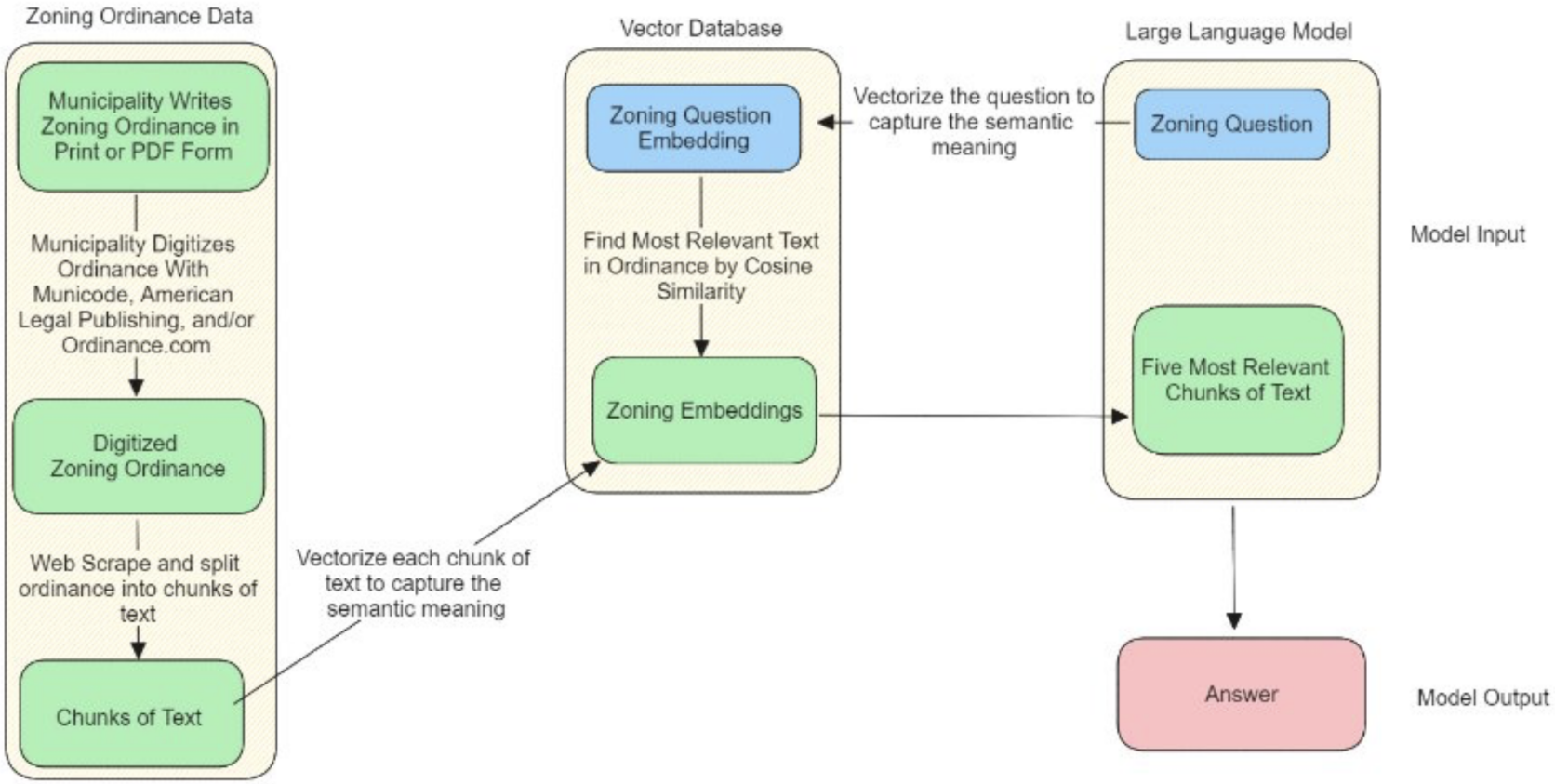
1. Descriptive patterns & illustrations
2. Data generation
3. Coding help
4. Math
5. Formatting support
6. Writing support

Descriptive patterns: monetary policy timeline

Overview of FOMC decisions with dates and policy changes
https://chat.openai.com/share/4caf465e-8555-4b8f-a2a1-a40f50b84c2a

Data generation: automated zoning measurement

Bartik, Gupta, Milo (2023) - “The Cost of Housing Regulation: Evidence from Generative Regulatory Measurement”



Data generation: automated zoning measurement

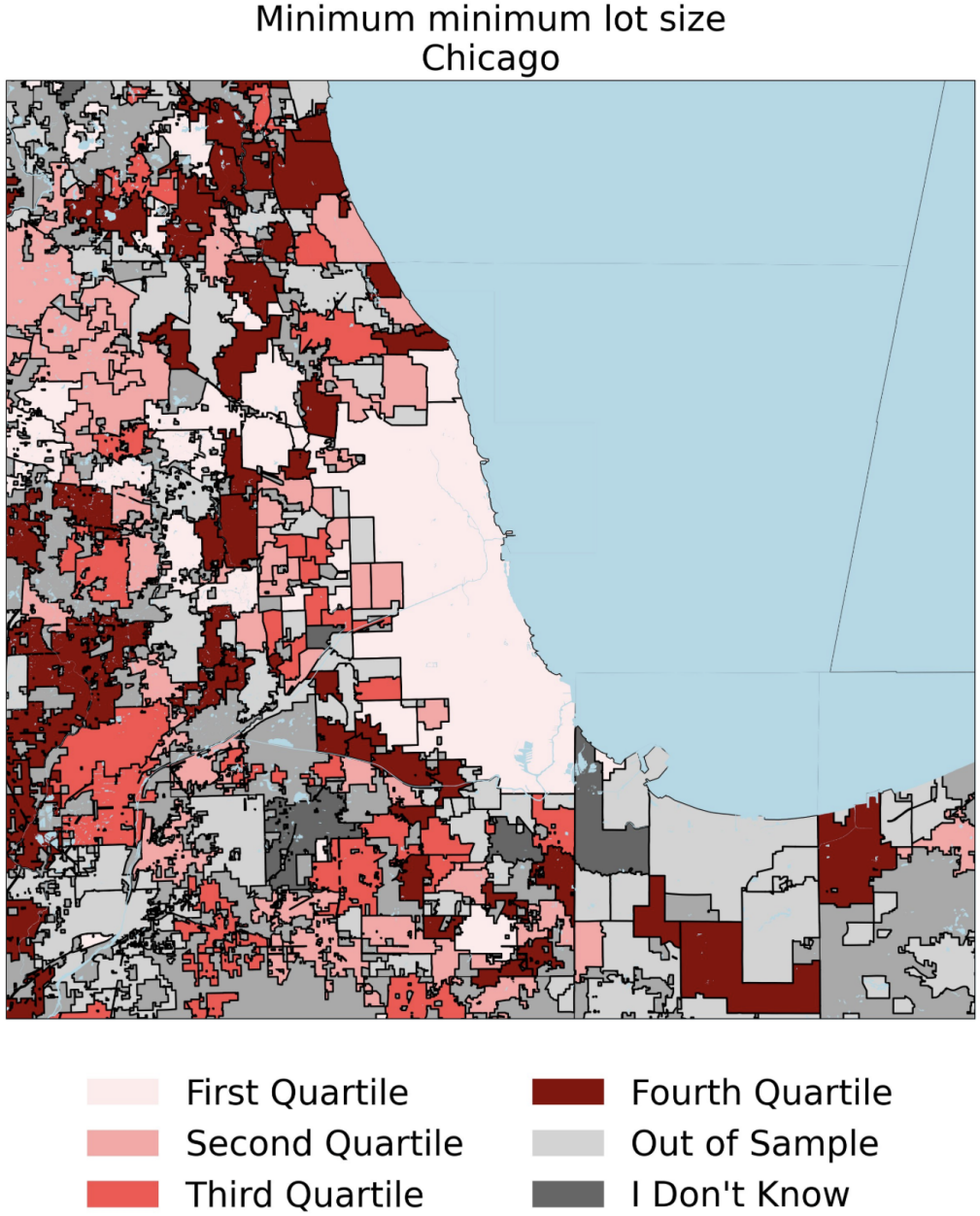


Figure 1: Automated zoning map example

Coding help

- Troubleshoot errors, optimize existing code
- Translate between coding languages
- Draft code, show package syntax

https://chat.openai.com/share/3bc2613d-9ae1-40a4-87c6-0b7faf9419c6

Math

I solved for a labor demand equation as part of a spatial equilibrium model and wanted to check that my algebra was correct. GPT 4 does this well for basic MWG things - also works to generate example solutions for problem sets, get Tex code for things already solved on paper etc.
https://chat.openai.com/share/61f56b92-fc74-4909-842f-2df50ddc4273

Formatting & writing support

- Detect imprecise phrasing or syntax errors in texts (e.g. referee reports)
- Convert bullet points into first draft (e.g. grants)
- Convert various formats into Tex, e.g. HTML or screenshots of tables
- Many examples and approaches in Mollick (2024), *Co-Intelligence*

Which Chatbot to use for what?

1. ChatGPT 4: reasoning, math, coding - but good all-around
2. Claude 3: long text, writing
3. Bing Copilot, Creative Mode: Web search tasks

Questions?