Federal Reserve Bank of New York
Second District Advisory Council Meeting
Hybrid
Tuesday, June 20, 2023

AGENDA

1:00 p.m. – 1:05 p.m.	Welcome Remarks, Shawn Phillips, Head of External Engagement
1:05 a.m. – 1:10 p.m.	Introductory Remarks, John Williams, President & CEO
1:10 p.m. – 1:20 p.m.	National Economy Update, Jonathan McCarthy, Economic Research Advisor
1:20 p.m. – 1:40 p.m.	Member Q&A with President Williams and Economists
1:40 p.m. – 1:50 p.m.	Artificial Intelligence Presentation, Harry Mendell, Technology Architect
1:50 p.m. – 2:50 p.m.	Member Insights, Shawn Phillips, Head of External Engagement Moderator
2:50 p.m. – 3:00 p.m.	Concluding Remarks, John Williams, President & CEO

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Discussion Questions

1. How are you utilizing AI or thinking about utilizing AI?
2. Since we last met how have business and economic conditions improved and what has remained a challenge or worsened (e.g., recruitment and retention of workers, access to capital)?
3. What is your overall outlook through 2023?

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<u>Attendee List - Hybrid</u>

SDAC Members
<u>In- Person</u>
Donnel Baird
Founder & CEO President
BlocPower

Hugh Johnston
Vice Chairman & CFO
PepsiCo

Sarah LaFleur
Founder & CEO
M.M. LaFleur

<u>Virtual</u>
Frederico Stubbe, Jr.
Chief Executive Officer
PRISA Group

Jaswinder Chadha
President & CEO
Axtria, Inc.

<u>Tentative</u>
Anthony E. Shorris
John Weinberg/Goldman Sachs
Visiting Scholar & Senior Advisor
Princeton University, McKinsey & Company

Federal Reserve Bank of New York
John Williams, President & CEO
Jack Gutt, Communications & Outreach
Shawn Phillips, Communications & Outreach
Andrea Grenadier, Communications & Outreach
Harry Mendell, Technology
Rosanne Notaro, Legal
Jaison Abel, Research & Statistics
Jonathan McCarthy, Research & Statistics
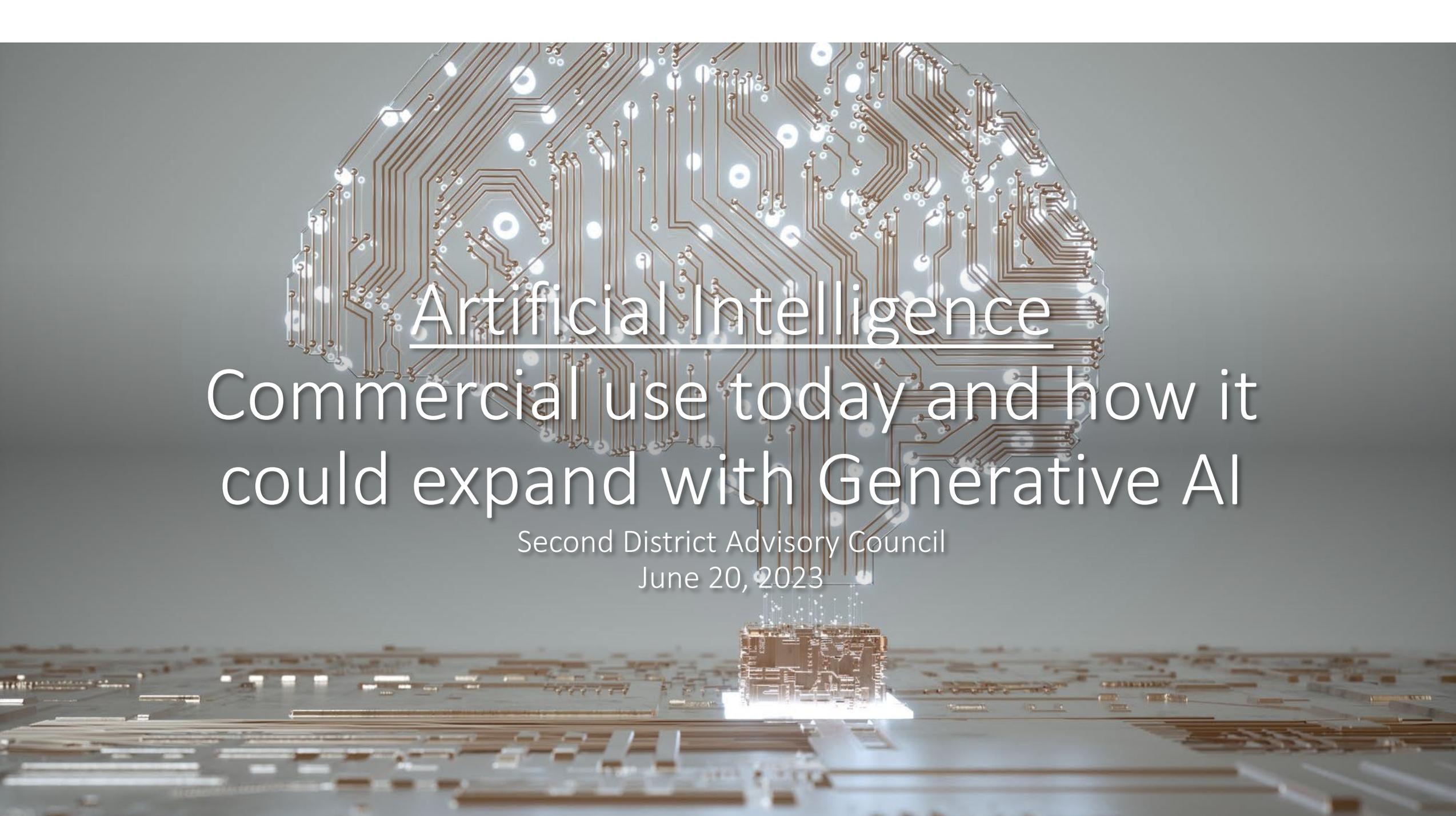
Artificial Intelligence

Commercial use today and how it could expand with Generative AI

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AI has had many commercial capabilities for many years, including:

- Prediction from large numbers of factors
- Recognition of patterns
- Image classification
- Fraud detection
- Speech recognition
- Sentiment Analysis
- Language Translation
- Semantic search

If AI can already do so much, what is all the buzz about Generative AI and how did it come about?

- AI took a major step forward when deep learning had its "image net" moment in 2012 where many barriers unlocking deep learning were solved.

- Word2Vec (invented in 2013) is a technique that learns how related a word is to other words by trying to guess missing words that are intentionally hidden from the algorithm while training on huge amounts of news stories and text found on the internet.

- This idea was extended to capture the meaning of sentences based on the context in which words are used in sentences (Transformers 2017). Transformers became the new building block of AI for Natural Language Processing and other use cases. The number of words that could be related in context has grown to tens of thousands.

- Google, OpenAI and Meta started expanding the size of both the training data and the model size resulting in what we now call Foundation Models or Generative AI.

- The appeal of Generative AI is that it responds to prompts in natural language and they are flexible in application.

- Commercial business use is in its beginning stages and much experimentation is needed.

Examples: Use of AI for Consumer Marketing

Fast and effective content creation

Consistent writing style ensuring a uniform brand voice, writing style, and format

Enhanced use of unstructured, inconsistent, and disconnected data

Ability to interpret abstract data sources such as text, image, and varying structures

Target individual user preferences, behavior, and purchase history to generate personalized product descriptions and advertisements

Generative AI could be a game changer for retail and consumer packaged goods companies

Generative AI could automate key functions such as customer service, marketing and sales, and inventory and supply chain management.

Generative AI's ability to personalize offerings could optimize marketing and sales activities already handled by existing AI solutions. Similarly, generative AI tools excel at data management and could support existing AI-driven pricing tools.

AI offers retailers and CPG companies many opportunities to cross-sell and upsell, collect insights to improve product offerings, and increase their customer base, revenue opportunities, and overall marketing ROI.

Generative AI tools can enhance the process of developing new versions of products by digitally creating new designs rapidly. A designer can generate packaging designs from scratch or generate variations on an existing design.
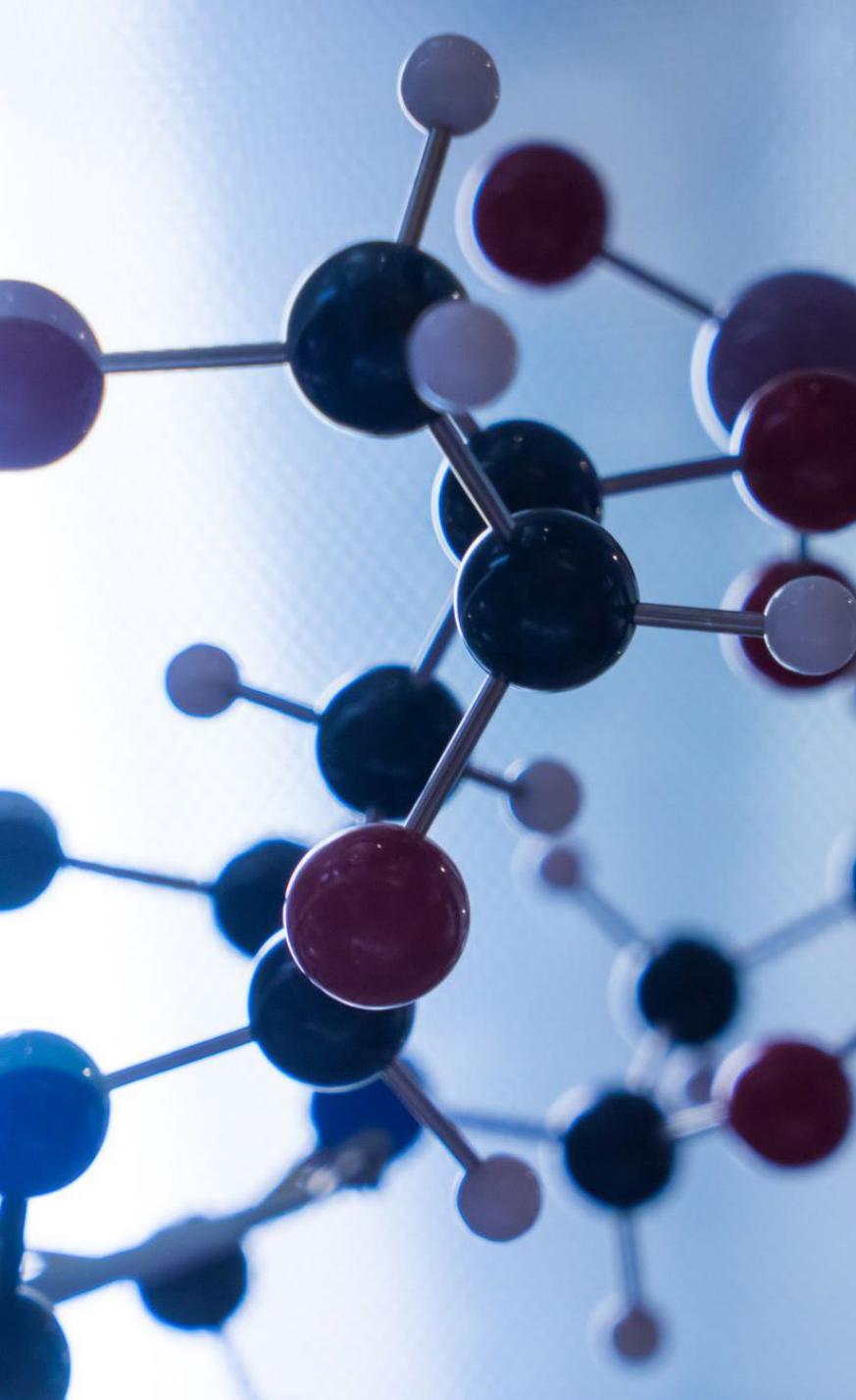
Generative AI foundation models can be used in Life Sciences for what is known as "generative design," which can:

- Generate candidate molecules from foundational models, accelerating the process of developing new drugs and materials;

- Pair generative AI with automated synthetic development tools to design small-molecule therapeutics;

- Accelerate the selection of proteins and molecules best suited as candidates for new drug formulation;

- Map patient cohort's clinical events and medical histories—including potential diagnoses, prescribed medications, and performed procedures—from real-world data; and

- Allow research to quantify clinical events, establish relationships, and measure the similarity between the patient cohort and evidence-backed indications.
  - The result is a short list of indications that have a better probability of success in clinical trials because they can be more accurately matched to appropriate patient groups.

Generative AI in Real Estate Development
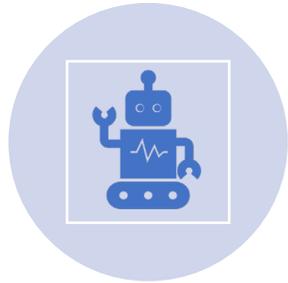
Generative AI allows for the creation of personalized property designs, virtual staging, and tailored recommendations.
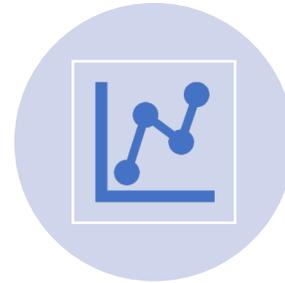
Generative AI can analyze vast amounts of data on real estate, market trends, and historical records. Generative AI can extract meaningful insights from these data to provide more accurate market analyses, property valuations, and price predictions.
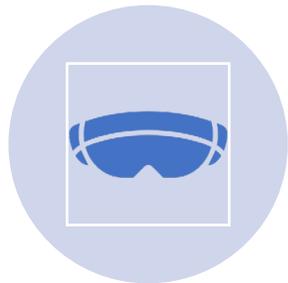
Virtual staging allows vacant properties to virtually be furnished and presented to potential buyers. This creates a more immersive and appealing experience. AI-powered tools enabled architects and designers, for example, to create virtual walkthroughs and renderings. This allowed stakeholders to assess and visualize properties or constructions remotely.

Generative AI is a great tool for developing smart building systems which automatically adjust the amount of energy consumed according to the occupancy of buildings, weather conditions, and many other variables.

Use of AI in software development can lead to a 30% increase in productivity

- Data Cleaning Software engineers and product managers use generative AI to assist in analyzing, cleaning, and labeling large volumes of data, such as user feedback, market trends, and existing system logs.

- Architecture: Engineers use generative AI to create multiple IT architecture designs and iterate on the potential configurations, accelerating system design, and allowing faster time to market.

- Coding: Engineers are assisted by AI tools that can code, reducing development time by assisting with drafts, rapidly finding prompts, and serving as an easily navigable knowledge base.

- Testing: Engineers employ algorithms that can enhance functional and performance testing to ensure quality and can generate test cases and test data automatically

- Maintenance: Engineers use AI insights on system logs, user feedback, and performance data to help diagnose issues, suggest fixes, and predict other high-priority areas of improvement.

- Large technology companies are already selling generative AI for software engineering, including GitHub Copilot, which is now integrated with OpenAI's GPT-4, and Replit, used by more than 20 million coders -Michael Nuñez, "Google and Replit join forces to challenge Microsoft in coding tools," VentureBeat, March 28, 2023.

- Peter Cihon et al., *The impact of AI on developer productivity: Evidence from GitHub Copilot*, Cornell University arXiv software engineering working paper, arXiv:2302.06590

Using AI Responsibly

Security

Reliability

Privacy

Fairness

IP

Explainability

Some reasons to be cautious….

- Generative AI has increased the need to understand whether generated content is based on fact or inference, requiring a new level of quality control.

- Foundation models are a prime target for attack by hackers and other bad actors, increasing the variety of potential security vulnerabilities and privacy risks.

- To address these concerns, companies will need to strategically keep humans in the loop and ensure security and privacy are top considerations for any implementation. Companies will need to institute new quality checks for processes previously handled by people, such as emails written by customer reps, and perform more-detailed quality checks on AI-assisted processes such as product design.