CODE PRESENTS

# The Age of AI, GPT, Azure OpenAI and Copilot

**Markus Egger**

President and Chief Software Architect

CODE CONSULTING CODE STAFFING CODE MAGAZINE CODE TRAINING

# Kicking Things Off

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- **Jim Duffy**
- V.P. of Business Development, Marketing & Sales
- Former Developer – Drawn to the Dark Side: Now Responsible for Marketing & Business Development
- jduffy@codemag.com / My Bio
- Former Microsoft RD (Regional Director) 9 years
- Former 11-time Microsoft Most Valuable Professional (MVP)

# About CODE Group

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## "Helping People Build Better Software"

- Custom Software Development, Training, Mentoring,…
- Web, Cloud, Mobile, Desktop, Serverless, Databases,…
- Copilot Development, AI, GPT & Azure OpenAI
- Application Security Testing & Developer Training
- User Interface and Interaction Design
- Project Rescue, App Modernization,…
- Strategic Staff Augmentation

Microsoft

Gulfstream
A GENERAL DYNAMICS COMPANY

eog resources

wisetech global

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- Disrupting the world of staffing!
- Giving our customers the ability to have staff on par with Silicon Valley companies…
- …and our employees a work environment in a bleeding-edge tech company with the **industry leading benefits**!

- www.codestaffing.com

# We Need You!

- We are currently “hiring on all cylinders” across the entire CODE Group Organization!
- Check out www.codestaffing.com/careers

# CODE AI & CODE Copilot

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- Helping companies implement AI features is now a major service we offer
- This is especially true for copilot-stye features in existing and new applications
- Contact us for more information and to schedule a free demonstration and/or brainstorming session
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- www.codemag.com/ai

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- Free Webinars
  - State of .NET: Microsoft Build Recap (May 31)
- Training Classes
  - Secure Coding for C# Developers (June 6 & 7)
  - Introduction to Development with Open AI, ChatGPT, Azure Open AI, and more... (June 21)
  - Secure Coding for C# Developers (Sept 5 & 6)

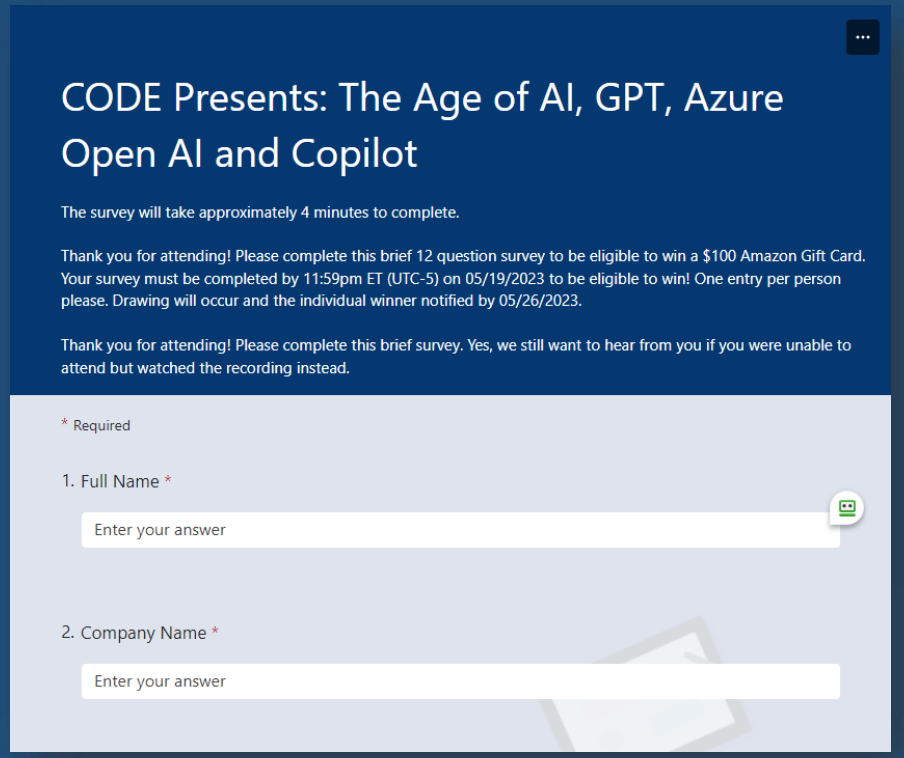
**https://www.codemag.com/training**

# Event Survey – Win $100!

- **Starting at 1:15pm ET** Complete this very short 12 question survey for a chance at a $100 Amazon Gift Card!

https://bit.ly/41EZZEH

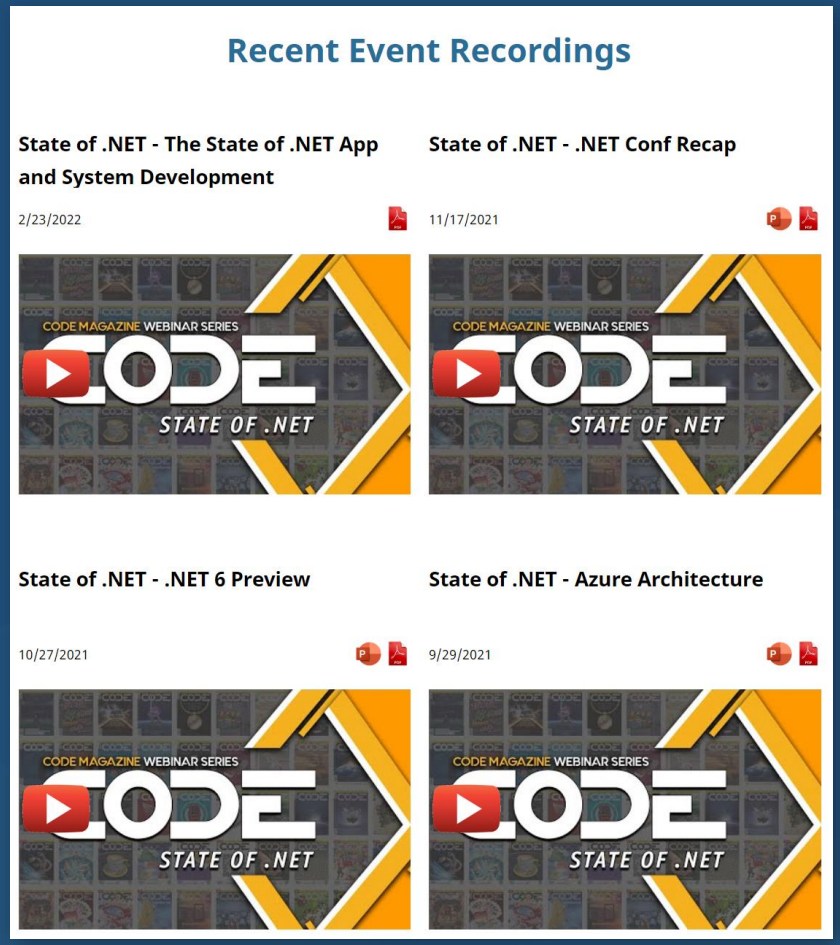
- Survey must be completed by **11:59pm ET** on **Friday 05/19/2023** to be eligible!




THIS SLIDE WILL BE REPEATED AT THE END AND SURVEY LINK REPEATED IN THE CHAT WINDOW!

# Recordings & Slide Decks

- State of .NET Webinar Series
  - https://www.codemag.com/StateOfDotNet
- CODE Presents Webinar Series
  - https://www.codemag.com/CODEPresents



# About Our Presenter

- **Markus Egger**
- President and Chief Software Architect
  EPS Software Corp. (dba CODE Consulting)
- CEO – CODE Staffing
- Publisher – CODE Magazine
- International Author and Speaker
- Microsoft RD (Regional Director)
- Microsoft MVP 1995-2019
- Email: markus@codemag.com
- Twitter: @markusegger

# Agenda

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- Overview of current AI and AI capabilities
- Open AI and Azure Open AI as a next-generation development platform and paradigm
- Copilots as the new paradigm

- At first: Slides, but then,
  real-world examples and code! ☺

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# AI Overview

# What is Artificial Intelligence and ML?

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- The ability of a machine to perform “intelligent” tasks
- But what is “intelligent” in that sense?
- What is “intelligence” in any sense?

- “AI” is often described as “what’s just beyond what machines can do today”

- Today, we are generally talking about mathematical models and pattern matching

# Examples of Computers being “Intelligent”

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- Searching for data
- Playing Chess or GO
- Predicting user input
- Predicting the stock market
- Visual & audio recognition
- Machine translation
- Writing legal contracts

# The Waves of Artificial Intelligence

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Internet AI

Business AI

Perception AI

Autonomous AI

# Different Types of AI

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- “Dumb” AI
- Shallow Learning
- Deep Learning
- Narrow AI
- General Artificial Intelligence

# “Superhuman Intelligence”

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- What does it mean to be “generally smarter than humans”?
  - Faster?
  - More memorization?
  - Considering more factors?
  - More complex?
  - More accurate?
  - Better pattern matching?
  - Fewer errors?
  - Self-aware?
  - Scalability?
  - …
- Will we get there? When? Does it matter?

- *Note: It seems to me, we are even lacking proper vocabulary to discuss this issue at any depth*

# Is Artificial Intelligence Dangerous?

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- The “Singularity”
- Run-Away General Artificial Intelligence
- What today’s (and tomorrow’s) AI is ***NOT***:
  - It’s not generally intelligent
  - It’s not conscious or self-aware
  - It’s not cunning
  - It doesn’t appreciate humor
  - It doesn’t have its own goals
  - It doesn’t have feelings, empathy, love, or appreciate beauty
  - It’s not self-motivated or driven by its own agenda
  - It’s not a person

# AI and Robotics

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- We are much further along in AI than in corresponding robotics
- Calculating what “should be done” in the world (such as performing a physical task) is more realistic than having a robot perform that task
- Once an AI algorithm is created, it can be shared worldwide and inexpensively… creating corresponding robots is expensive and time consuming

# AI Impact on the Economy

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- Estimates and timeframes for AI replacing human jobs vary greatly
- A rough average seems to be that by 2040-2050, about 50-60% of current jobs can be replaced by AI
  - Whether they will be, is a different question
- The expected characteristic is that mainly the “middle” will be affected, while low-skill and high-skill jobs should be around longer
- Clearly, this will have an extreme impact on society

# Factors on “Winning the AI Game”

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DATA, DATA, DATA, AND MORE DATA (FREELY AVAILABLE)

AVAILABILITY OF COMPUTE POWER (CLOUD AND OTHERWISE)

FUNDING AND ENTREPRENEURSHIP

WELL-TRAINED AI SCIENTISTS

A SUPPORTIVE POLICY ENVIRONMENT

# Recommended Reading

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# AI & Machine Learning in Practice Today

# Our Capabilities Today

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- Narrow Learning (Deep and Shallow)
- No real General Artificial Intelligence
  - Although that term is also used in confusing ways
  - I also question whether “general” AI is all that critical for our purposes
- The results we can already achieve are both mind-boggling and very practically useful

# Using AI Today

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BUILT INTO APPS AND SERVICES

DEVELOPING AGAINST PRE-TRAINED AIS

TRAINING YOUR OWN AIS

# Azure Cognitive Services

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- Speech
  - Speech to text, text to speech, translation, speech and speaker recognition
- Language
  - Sentiment analysis, translation, question answering, conversation, reco,…
- Vision
  - Computer vision, custom vision, face recognition
- Decision
  - Anomaly detection, content moderation, personalization
- **Azure OpenAI Services**

# Who is OpenAI?

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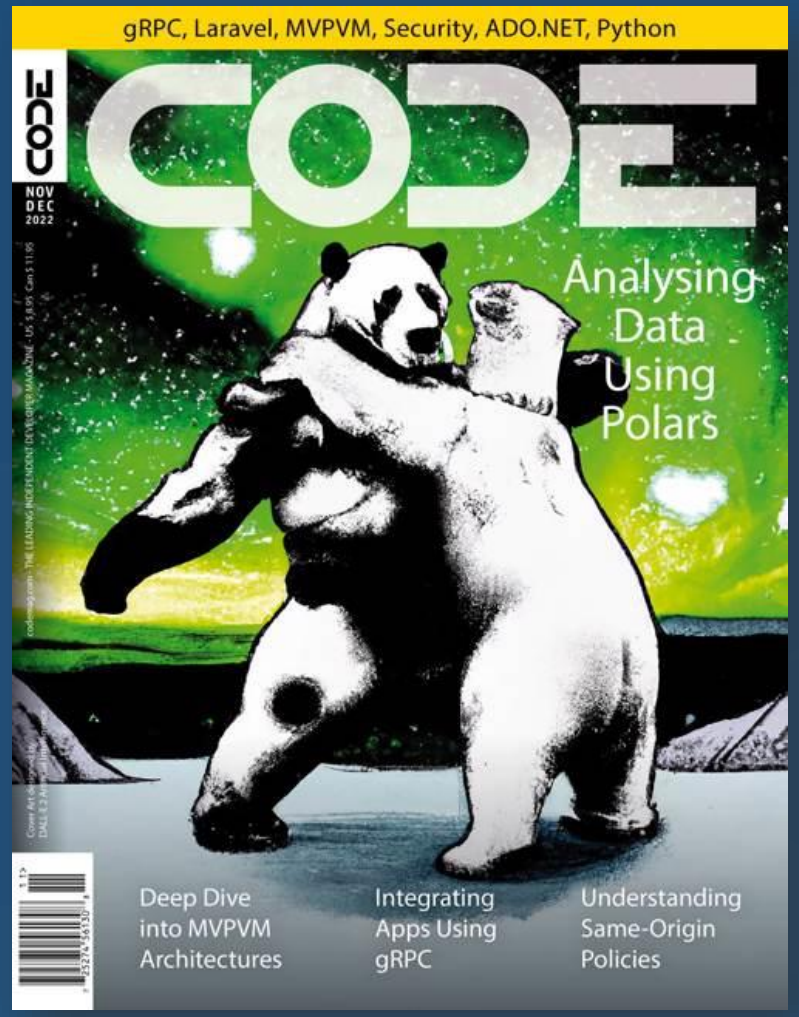
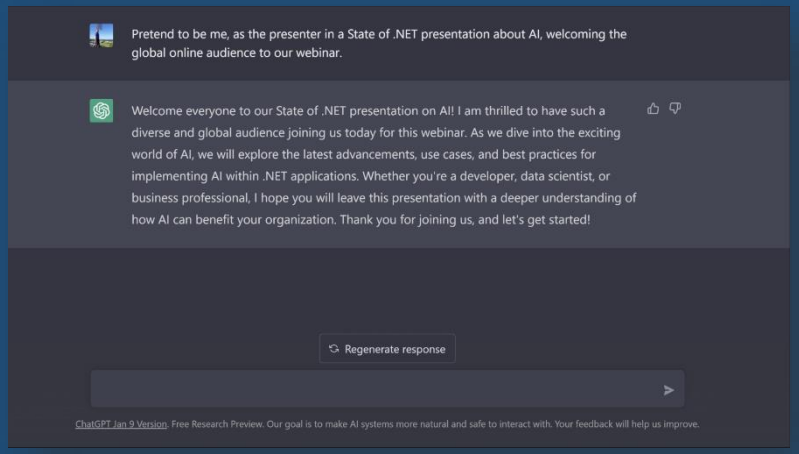
- Non-Profit OpenAI Incorporated
- For-Profit OpenAI Limited Partnership
- Founded in 2015 in San Francisco
- Microsoft made a $11 billion investment and reportedly owns 49% of OpenAI LP
- All OpenAI Infrastructure runs on Azure

# OpenAI – DALL-E 2



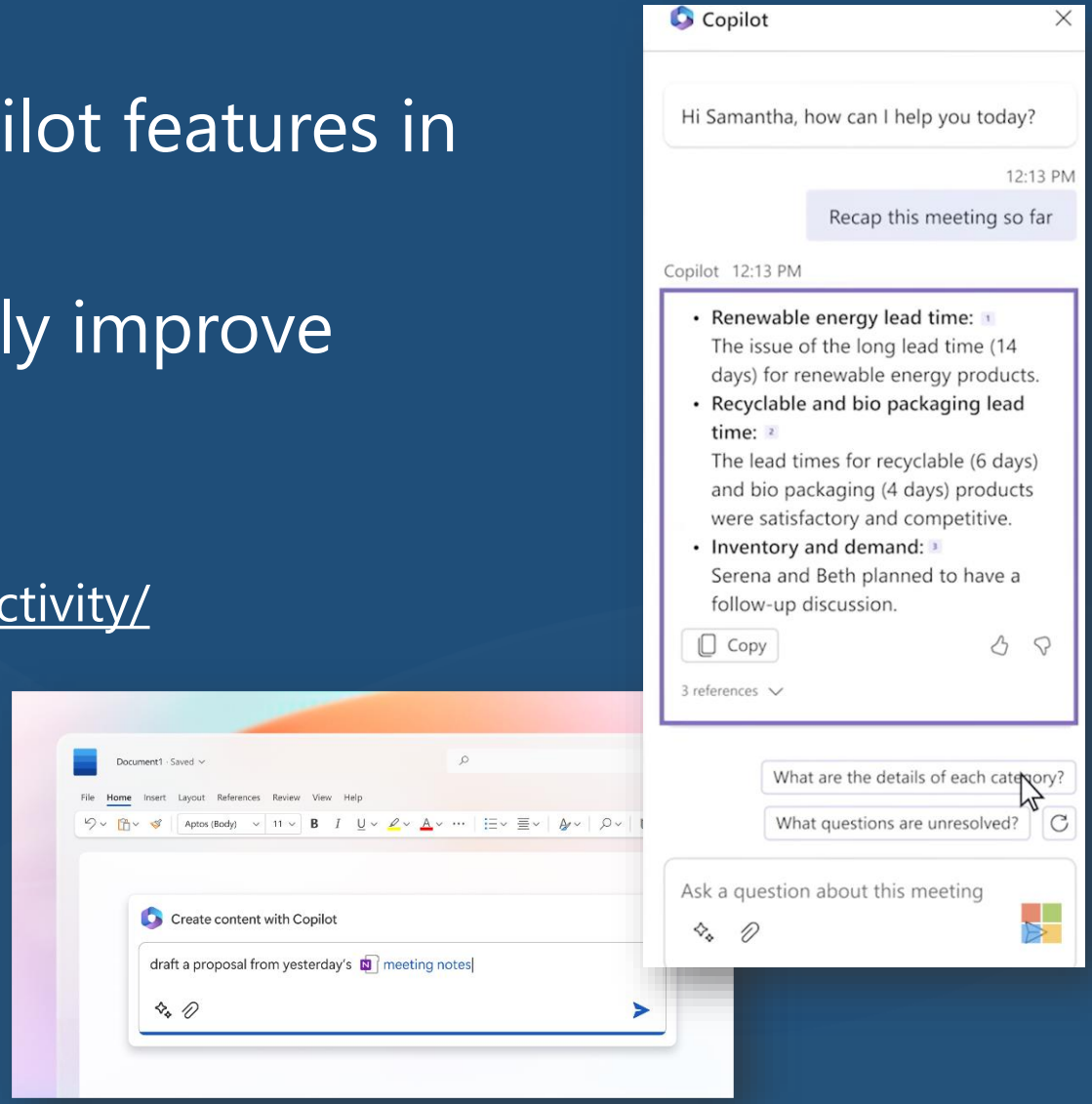
# OpenAI's ChatGPT




- *GPT = Generative Pre-Trained Transformer
- You have probably heard about this ☺
  - Although just very recently
- A technological leap that forms the basis for a lot of new tech
- Note that this is just a "text calculator"… just a very good one ☺
  - The result is that this does a lot more than was anticipated, even by the creators
- Microsoft is very heavily invested

# Microsoft Copilot

- Microsoft is now introducing Copilot features in practically all applications
- Copilots are expected to drastically improve productivity
  - They already are today!
- https://news.microsoft.com/reinventing-productivity/



# Github Copilot

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- Github Copilot assists in writing code
- Now used by over 1 million developers
- Productivity gains of more than 50%!

- Check out the recording from our State of .NET Webinar and on our YouTube channel!

# Resulting Characteristics of Copilots

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- Drastically improved productivity
  - Expected to improve 50%+ every year!
- Every year, twice as good. Every year, 1/10$^{th}$ of the cost.
- The situation is evolving extremely fast.
  - Faster than the Web wave was.
  - Faster than the Mobile wave was.
- We just went from “Software is eating the world!” to “**AI is eating software!**”.

# Resulting Characteristics of Copilots (cont.)

- We are only at the very beginning of all this. We are basically dealing with the AI equivalent of toddlers ☺
- No true Singularity will result from this, but…
  - …this may well be the start of drastic societal changes that makes the Industrial Revolution look like child-play.
  - …AI may create security and regulatory nightmares

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# All apps without Copilot features are now legacy!

# Azure OpenAI for Developers

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- OpenAI features are now available to use in our own applications through Azure OpenAI
  - You can currently sign up for approval
- Azure OpenAI provides access to OpenAI features with all the added Azure benefits
  - It is also possible to use OpenAI features directly from OpenAI, but the Azure version already adds a lot, and will likely add more in the future
- This provides an API that allows us to create our own Copilot-style features

# Side-Note: ML.NET

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- Machine Learning library for .NET developers
- Supports shallow and deep learning for narrow models
- Execution and training in all .NET applications
- Great for developers who already know .NET
- Support for model standards, such as ONNX or TensorFlow

# Other Announcements

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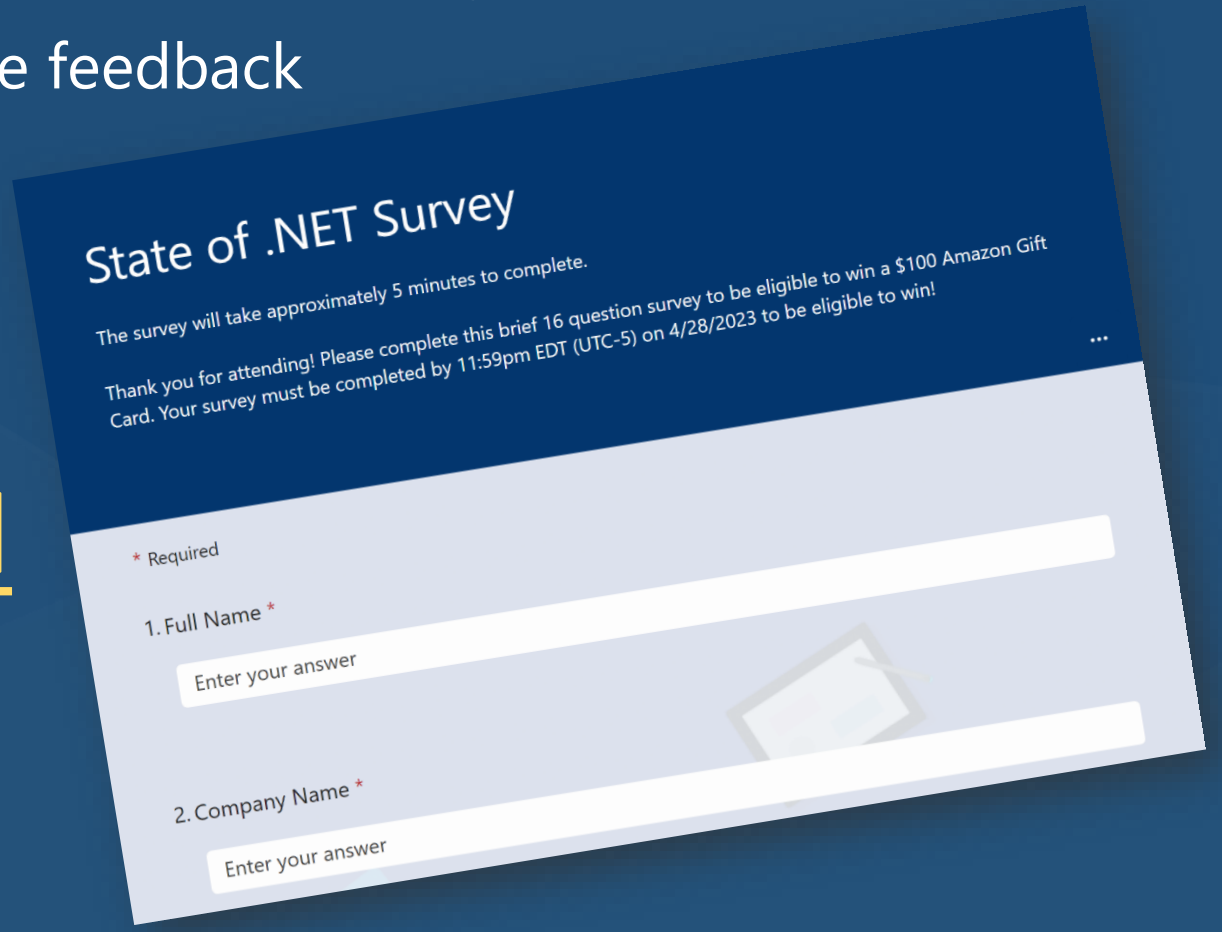

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# Next CODE Presents: LLMs!

- Large Language Models and how they really work
- By Dr. Otto Dobretsberger (CODE Senior Developer)
- Mid-June (exact date tba)

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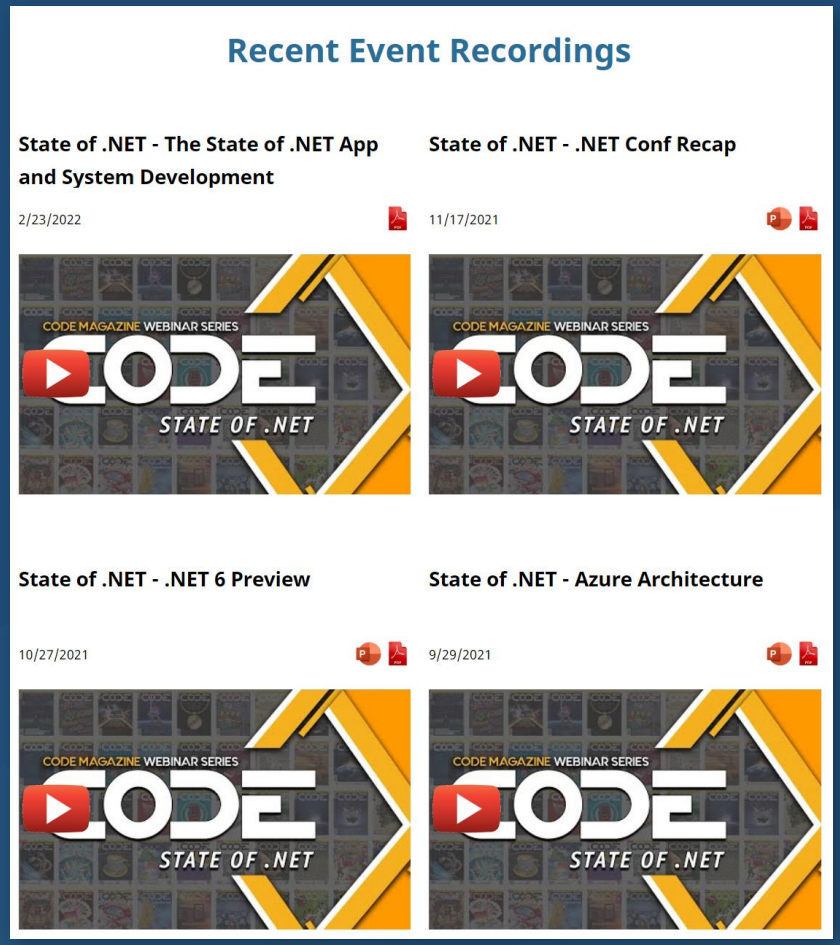

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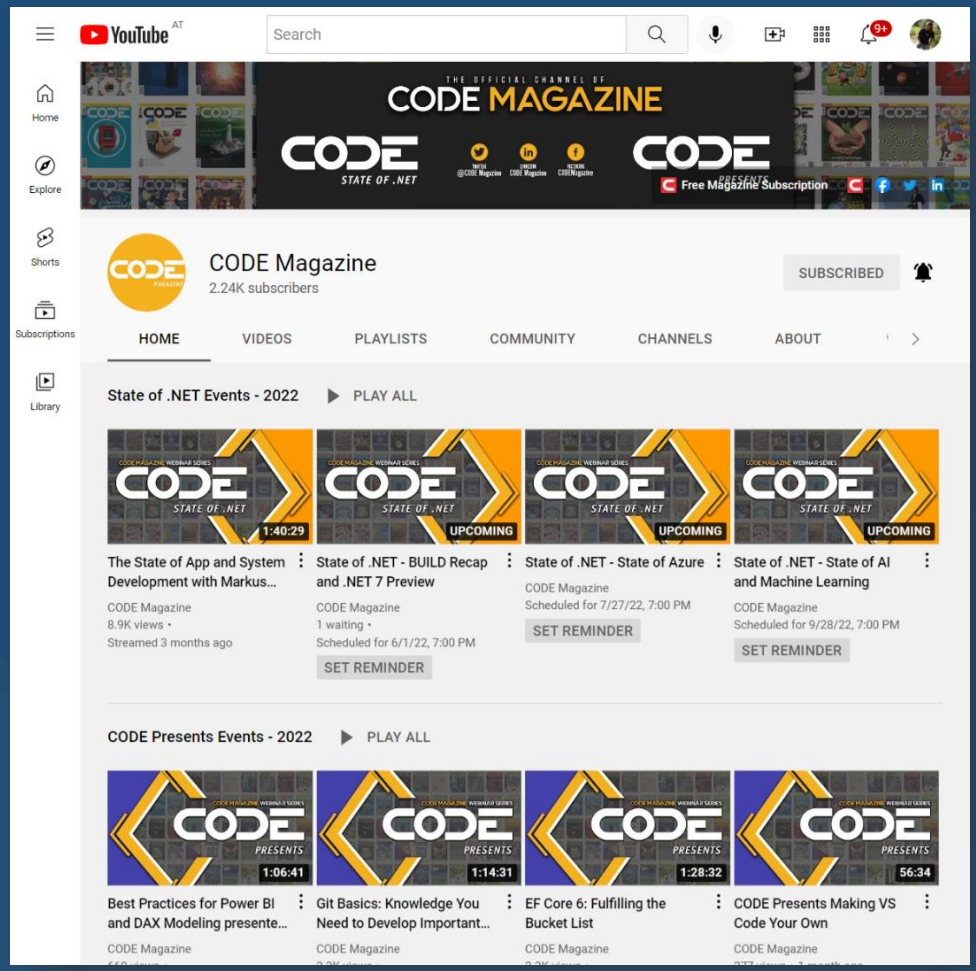

# Q&A

## Contact us with questions!


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