



State of .NET

State of AI and Machine Learning

Markus Egger

President and Chief Software Architect
CODE Magazine, CODE Consulting, CODE Staffing

Kicking Things Off

Jim Duffy

- Director of Business Development
CODE Magazine & Consulting
- Former Developer – Drawn to the Dark Side: Now Responsible for
Marketing & Business Development
- jduffy@codemag.com / [My Bio](#)
- International Author and Speaker
- Former Microsoft RD (Regional Director) 9 years
- Former 11-time Microsoft Most Valuable Professional (MVP)
- Twitter: @jmduffy



About CODE Consulting

“Helping People Build Better Software”

- Microsoft Certified Partner
- Custom Software Development, Training, Mentoring,...
- Web, Cloud, Mobile, Desktop, Serverless, Databases,...
- Application Security Testing & Developer Training
- User Interface and Interaction Design
- Project Rescue, App Modernization (VB, VFP, Access, etc.)
- Development Team Staff Augmentation



Join the CODE Consulting Team!

We're Hiring Developers!

- Junior to Senior roles
- FTE and/or contract
- Remote options
- Priority given to candidates in Houston, TX looking for FT, on-site opportunities
- Data Engineer and Python Developers
- UX Design Lead
- REACT & JavaScript Web Developers
- Senior C# Developers
- .NET Desktop Developers
- Sr. Data Engineer
- Senior Technical Recruiter

<https://codemag.com/Jobs>

CODE Security - Application Testing Services

- Are you sure your development team practices secure coding techniques?
- Have your application(s) been tested for security vulnerabilities?
- Are you prepared to share with your clients or customers that you've had a data breach?
- Reach out to us today about helping you change any No's to Yes's.



<https://codemag.com/Security>

CODE Training – Secure Coding Developer Training (Online)

- **Topics Include**

- Introduction to Cyber Security
- Introduction of Cryptography
- Authentication and Authorization
- Injection Attacks
- Introduction to Secure Coding and Motivation
- Secure Coding Best Practices
- API Security Considerations

- **Secure Coding For C# Developers**

- Mar 7 – 9
- Apr 18 – 20
- Jun 6 - 8

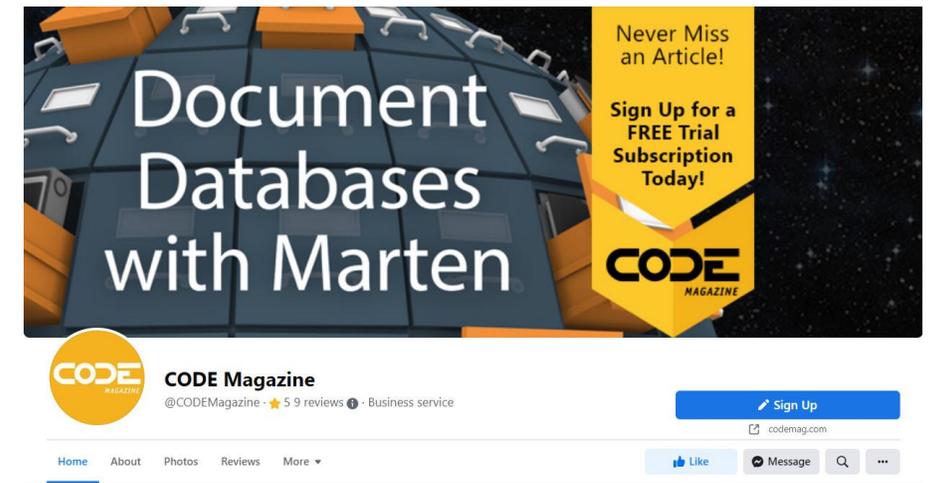
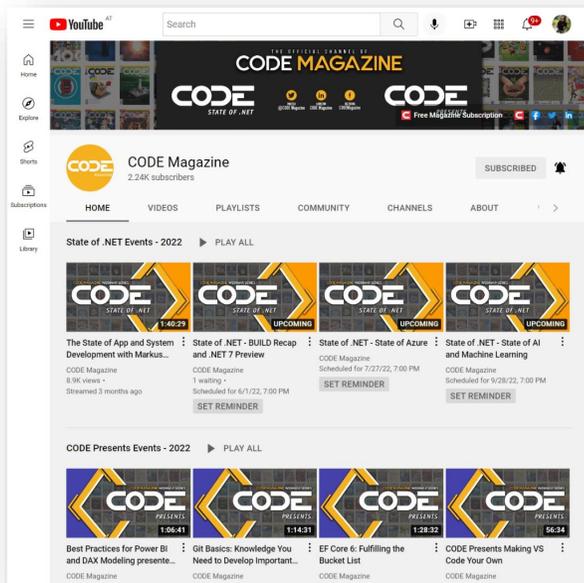
- **Secure Coding For Java Developers**

- May 2 – 4

Outlines & Abstracts at <https://codemag.com/Training>

Join Us On Social Media

- YouTube channel: <https://tinyurl.com/CODEYTC>
- Twitter: <https://twitter.com/CODEmagazine>
- Facebook: www.facebook.com/CODEMagazine/
- LinkedIn: <https://www.linkedin.com/company/code-magazine/>



Free Subscription to CODE Magazine!

- The leading software development magazine written by expert developers for developers.
- All registered attendees will automatically receive a free digital subscription to CODE Magazine – no need to do anything, it'll happen auto-magically.
- Subscribers get CODE Focus issues free of charge!

- Please share this free subscription link:
<https://bit.ly/3wppGLX>



CODE Magazine App

- Check out the new CODE Magazine Mobile application!
- Available for iOS & Android



Event Survey – Win \$100!

- Complete this very short 12 question survey for a chance at a \$100 Amazon Gift Card!

<https://bit.ly/3ZYmfJI>

- Survey must be completed by 11:59pm ET on Friday 1/27/2023 to be eligible!
- Name selected from registered attendee list. Completed survey is required to win.
- **THIS SLIDE WILL BE REPEATED AT THE END AND SURVEY LINK REPEATED IN THE CHAT WINDOW!**

State of .NET - State of AI and Machine Learning

The survey will take approximately 4 minutes to complete.

Thank you for attending! Please complete this brief 12 question survey to be eligible to win a \$100 Amazon Gift Card. Your survey must be completed by 11:59pm EDT (UTC-5) on 1/28/2023 to be eligible to win! One entry per person please. Drawing will occur and the individual winner notified by 2/3/2022.

Thank you for attending! Please complete this brief survey. Yes, we still want to hear from you if you were unable to attend but watched the recording instead. :-)

* Required

1. Full Name *

Enter your answer

2. Company Name *

Enter your answer

Build Cross Platform Apps With Photino

- Build native, cross-platform desktop apps that are lighter than light.
- Open-source framework for building native, cross-platform desktop applications with Web UI technology (HTML/CSS & JavaScript).
- Photino is maintained by the CODE Team with the help of the open-source community.

- tryphotino.io
- [Github.com/tryphotino](https://github.com/tryphotino)



Recordings & Slide Decks

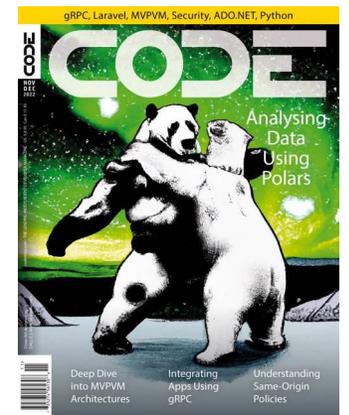
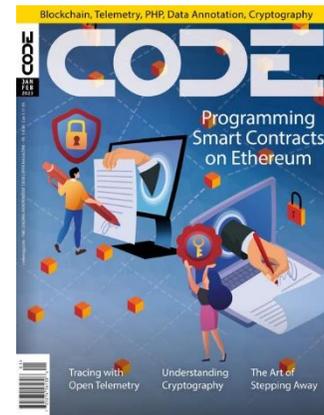
- State of .NET Webinar Series
 - <https://www.codemag.com/StateOfDotNet>
- CODE Presents Webinar Series
 - <https://www.codemag.com/CODEPresents>

Recent Event Recordings

State of .NET - The State of .NET App and System Development 2/23/2022	State of .NET - .NET Conf Recap 11/17/2021
	
State of .NET - .NET 6 Preview 10/27/2021	State of .NET - Azure Architecture 9/29/2021
	

About the Presenter

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



Agenda

- An Overview of AI and Machine Learning
- Some futuristic stuff
- Some very practical uses of AI in business applications today

AI Overview

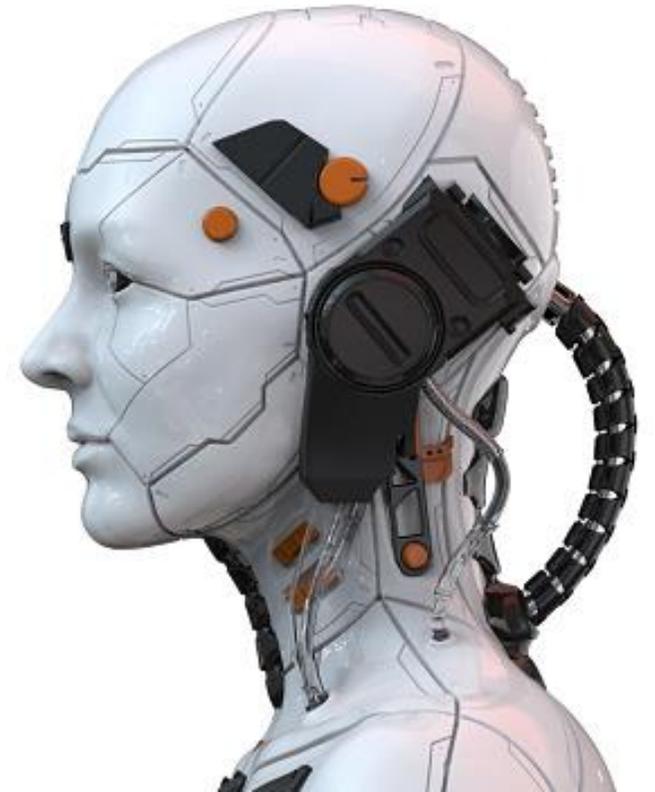


What is Artificial Intelligence and ML?

- 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”

- 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

- Internet AI
- Business AI
- Perception AI
- Autonomous AI

Different Types of AI

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

“Superhuman Intelligence”

- 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?

- 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

AI and Robotics

- 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

Adopting things for AI

- Does Artificial Intelligence really need to be like Human Intelligence?
- Examples:
 - Perhaps it would be better to create different road networks than to make AI operate on roads made for humans
 - Perhaps it would be better to create new construction techniques than to make AI work like a human construction worker

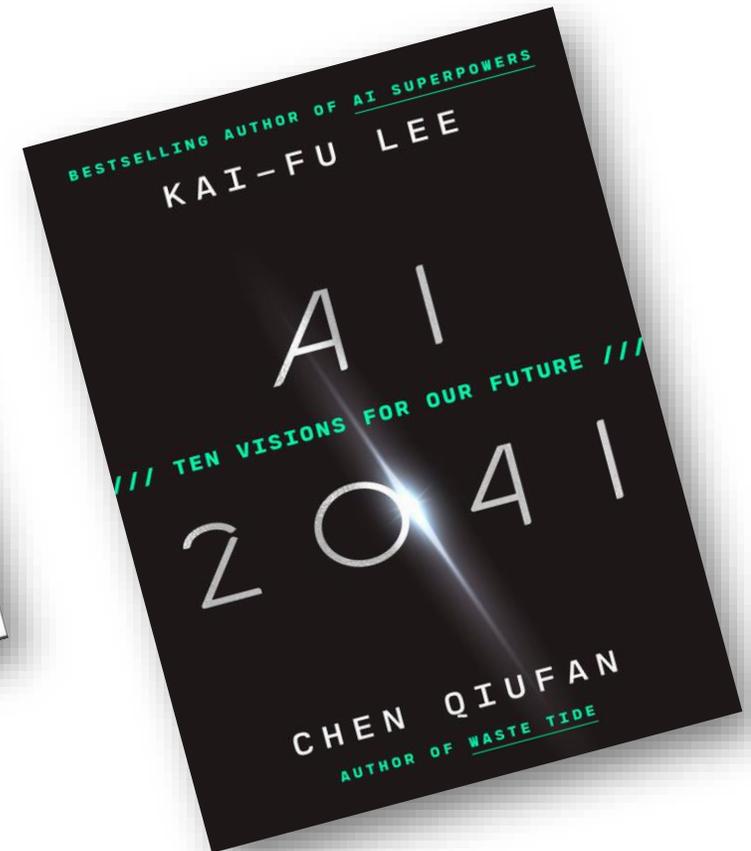
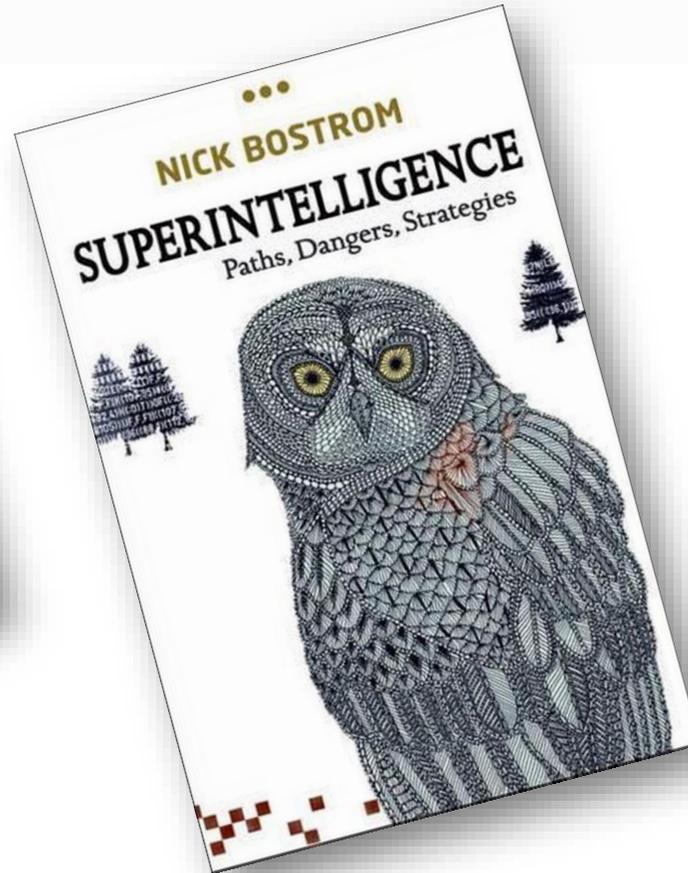
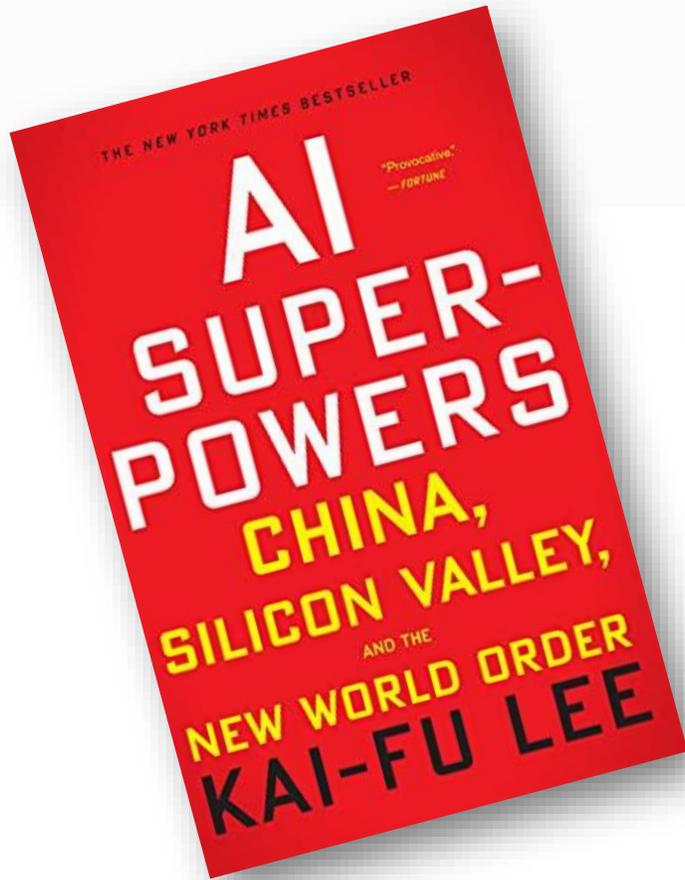
AI Impact on the Economy

- 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”

- 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



AI & Machine Learning in Practice Today

Our Capabilities Today

- 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

- Built into apps and services
- Developing against pre-trained AIs
- Training your own AIs

Open AI - ChatGPT



Pretend to be me, as the presenter in a State of .NET presentation about AI, welcoming the global online audience to our webinar.



Welcome everyone to our State of .NET presentation on AI! I am thrilled to have such a diverse and global audience joining us today for this webinar. As we dive into the exciting world of AI, we will explore the latest advancements, use cases, and best practices for implementing AI within .NET applications. Whether you're a developer, data scientist, or business professional, I hope you will leave this presentation with a deeper understanding of how AI can benefit your organization. Thank you for joining us, and let's get started!



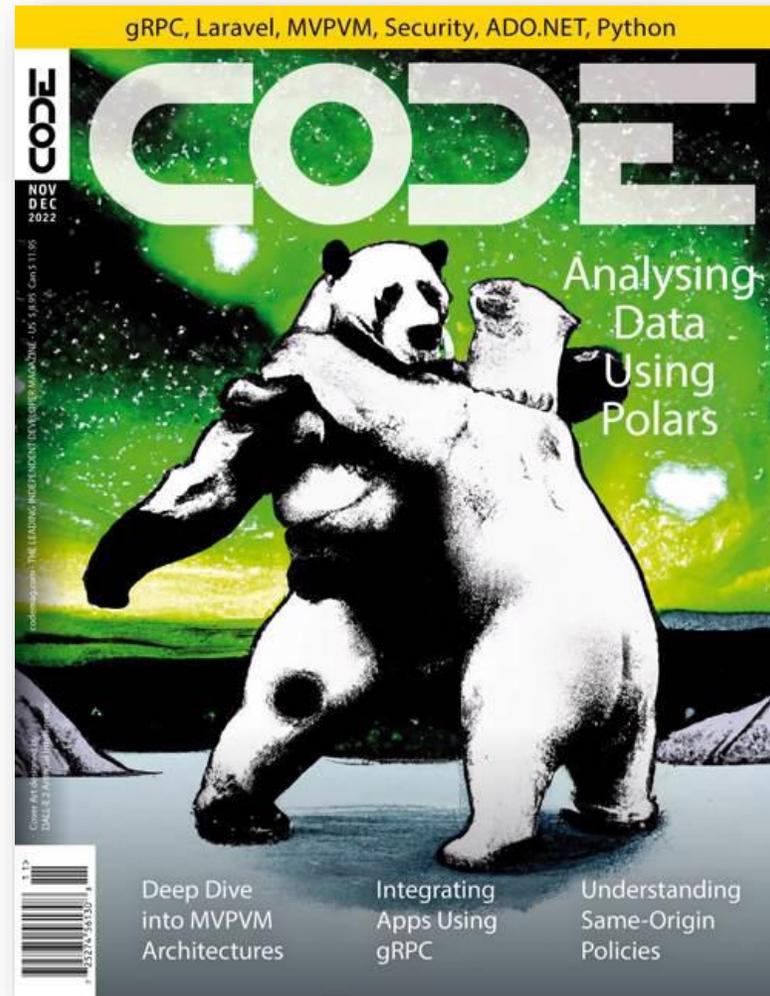
 Regenerate response



Github Copilot



Open AI – DALL-E 2



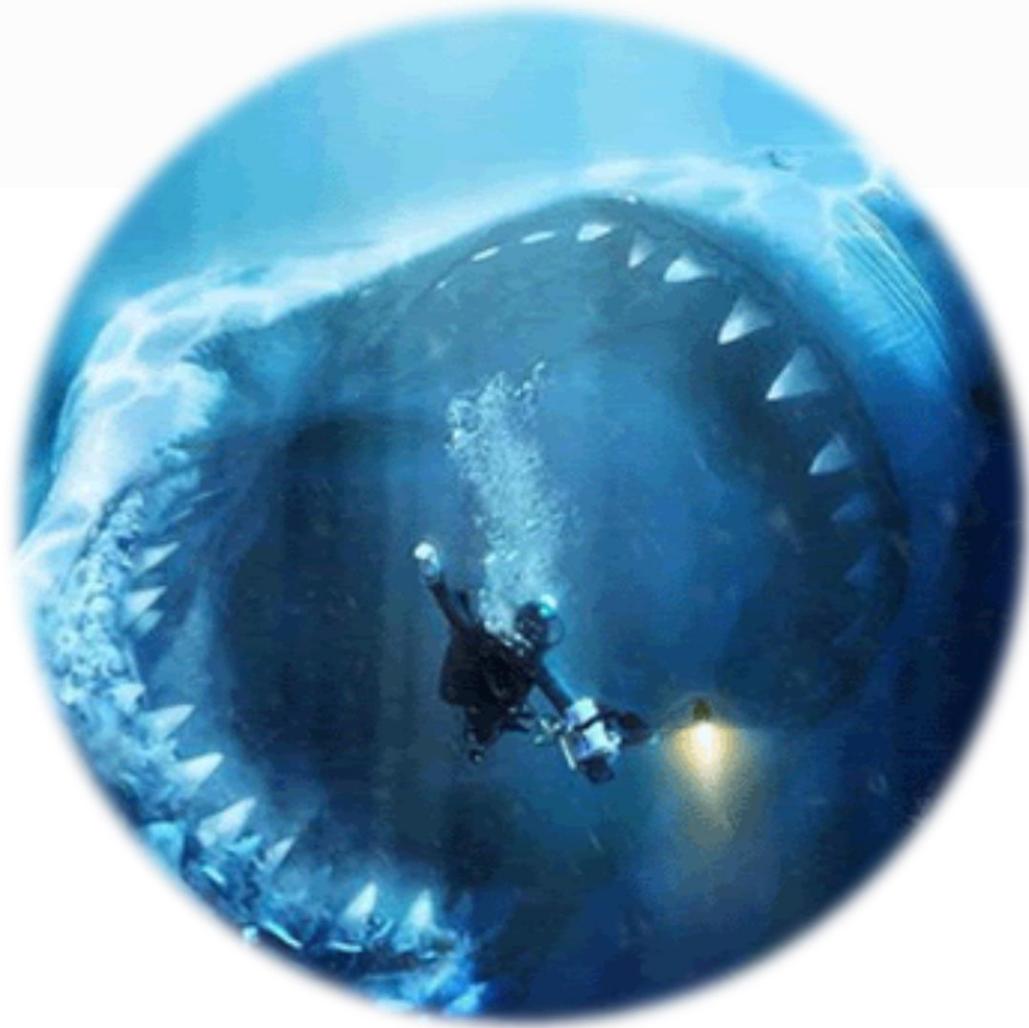
Azure Cognitive Services

- 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

Azure Applied AI Services

- Azure Form Recognizer
- Azure Metrics Advisor
- Azure Cognitive Search
- Azure Immersive Reader
- Azure Bot Service
- Azure Video Analyzer

Example: Fish ID



Example: Retina Images



Example: Logo Detection



ML.NET

- 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

Join the CODE Consulting Team!

We're Hiring Developers!

- Junior to Senior roles
- FTE and/or contract
- Remote options
- Priority given to candidates in Houston, TX looking for FT, on-site opportunities
- Data Engineer and Python Developers
- UX Design Lead
- REACT & JavaScript Web Developers
- Senior C# Developers
- .NET Desktop Developers
- Sr. Data Engineer
- Senior Technical Recruiter

<https://codemag.com/Jobs>

Event Survey – Win \$100!

- Complete this very short 12 question survey for a chance at a \$100 Amazon Gift Card!

<https://bit.ly/3ZYmfJI>

- Survey must be completed by 11:59pm ET on Friday 1/27/2023 to be eligible!
- Name selected from registered attendee list. Completed survey is required to win.

State of .NET - State of AI and Machine Learning

The survey will take approximately 4 minutes to complete.

Thank you for attending! Please complete this brief 12 question survey to be eligible to win a \$100 Amazon Gift Card. Your survey must be completed by 11:59pm EDT (UTC-5) on 1/28/2023 to be eligible to win! One entry per person please. Drawing will occur and the individual winner notified by 2/3/2022.

Thank you for attending! Please complete this brief survey. Yes, we still want to hear from you if you were unable to attend but watched the recording instead. :-)

* Required

1. Full Name *

2. Company Name *

CODE Security - Application Testing Services

Our expert consultants are experienced in identifying security vulnerabilities in your products, your services and/or your application's architecture.



<https://codemag.com/Security>

CODE Training – Secure Coding Developer Training (Online)

- **Secure Coding For C# Developers**
 - Mar 7 – 9
 - Apr 18 – 20
 - Jun 6 - 8
- **Secure Coding For Java Developers**
 - May 2 – 4

[Outlines & Abstracts at https://codemag.com/Training](https://codemag.com/Training)

Free Subscription to CODE Magazine!

- The leading software development magazine written by expert developers for developers.
- All registered attendees will automatically receive a free digital subscription to CODE Magazine – no need to do anything, it'll happen auto-magically.
- Subscribers get CODE Focus issues free of charge!

- Please share this free subscription link:
<https://bit.ly/3wppGLX>



Recordings & Slide Decks

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

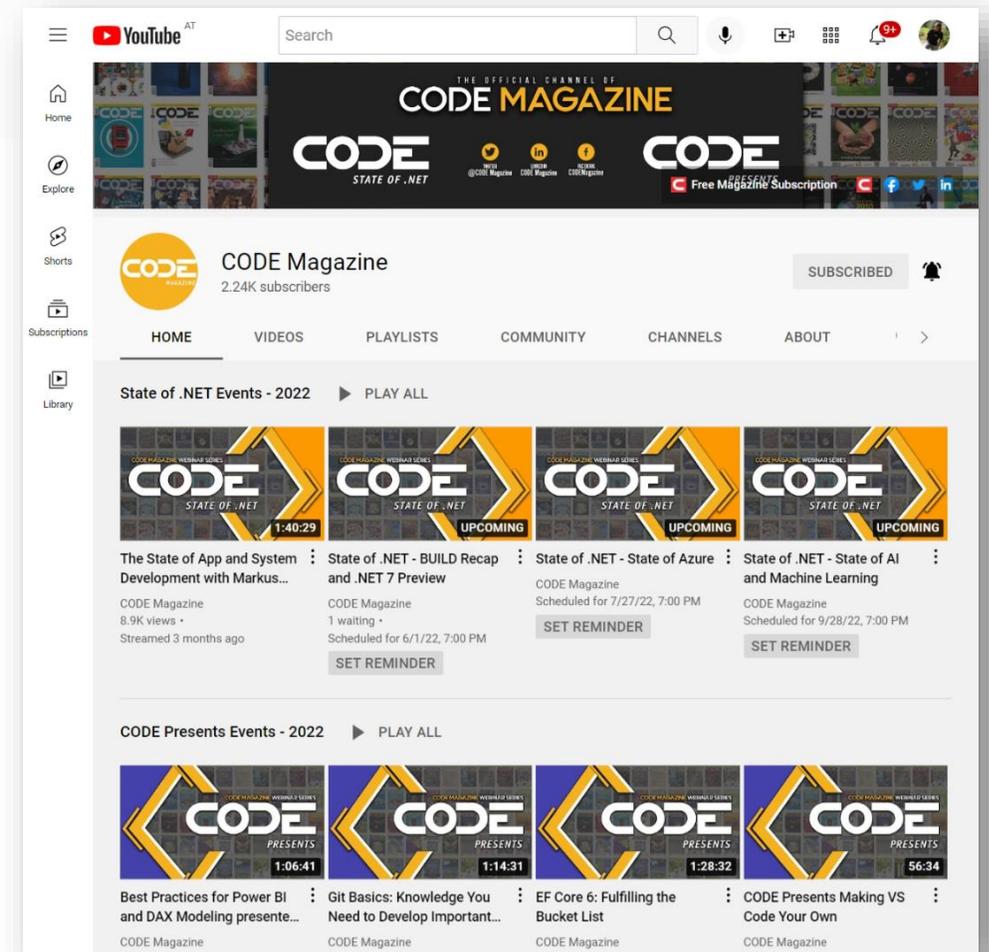
Recent Event Recordings

State of .NET - The State of .NET App and System Development 2/23/2022	State of .NET - .NET Conf Recap 11/17/2021
	
State of .NET - .NET 6 Preview 10/27/2021	State of .NET - Azure Architecture 9/29/2021
	

Subscribe to our YouTube Channel!

- Subscribe and “ring that bell” to never miss any of our content!

- www.youtube.com/Codemag



Upcoming Events

- State of .NET Online Webinar
 - March 22nd, 2023
- **In-Person** State of .NET
 - Houston, TX, April 26th, 2023

Q&A

Contact us with questions!

CODE/EPS Contact:

www.codemag.com
info@codemag.com
facebook.com/codemag
twitter.com/codemagazine

Presenter Contact:

markus@codemag.com
jduffy@codemag.com