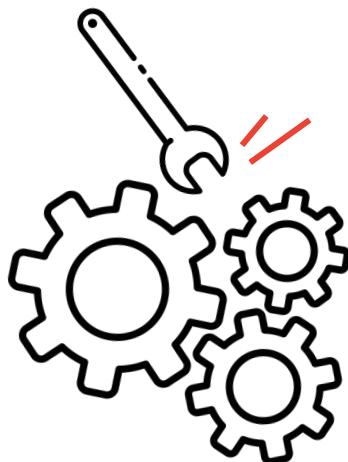


# Responsible AI

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# AI Everywhere

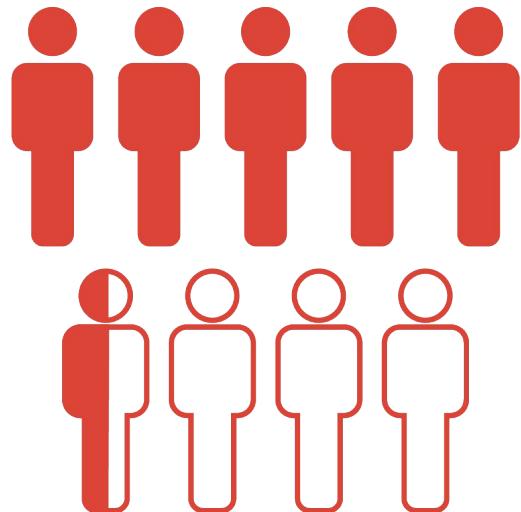
- AI offers **great benefits**, but at the same time it introduces **new risks** and **ethical challenges** (gait detection—identifying individual people)



- New technologies are **disruptive**, not **neutral**.  
**Artificial intelligence can...**
  - **Change** current practices
  - **Influence** human decisions
  - **Regulate** human behavior

# Why should we care?

- Pew Research shows that **65% of Americans** believe that companies “often fail to anticipate how their products and services will impact society”



# Why should we care?

- Pew Research shows that **65%** of Americans believe that companies “often fail to anticipate how their products and services will impact society”
- **Responsible AI** = **increased** marketability, **increased** product-adoption



- **2016:** Partnership on AI founded to **benefit people and society**
- Companies can **do well** by **doing good!**

# Traditional AI v. **TinyML**

- The distinct features of **TinyML** create unique **opportunities** and **challenges** (e.g., low-latency, battery-powered, on-device computing)
- Three promising **domains** for using **TinyML**:



Industry



Environment



Humans

- Does **responsible AI** *really* apply in **all** of these cases?

# TinyML in Industry



- Reduce downtime for repairs
- Increase efficiency
- Cost-effective



# TinyML in Industry



- Reduce downtime for repairs
- Increase efficiency
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- Accuracy—balancing missed detections and false alarms
- Explainability—can operators respond to alarms effectively?
- How will this affect the organization's workflow?

# TinyML in the Environment



- More detailed insights
- Less wasted data
- Cost-effective
- Overcome limitations of human labor



# TinyML in the Environment



- More detailed insights
- Less wasted data
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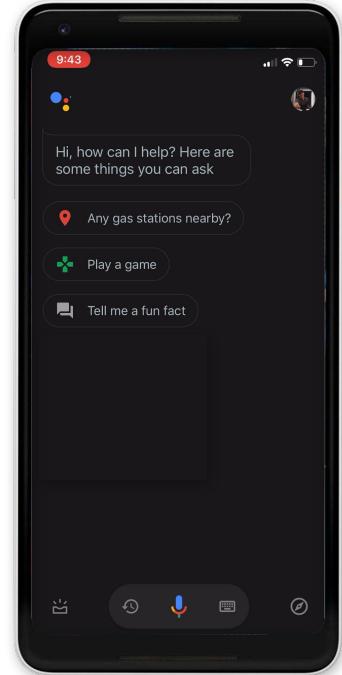
- Is the data reliable?
- Who has access to the data?
- Can devices be hacked by poachers?



# TinyML for Humans



- More accessible (hands-free)
- Intuitive UI + UX
- Allows for streamlined product design  
(fewer buttons/switches)



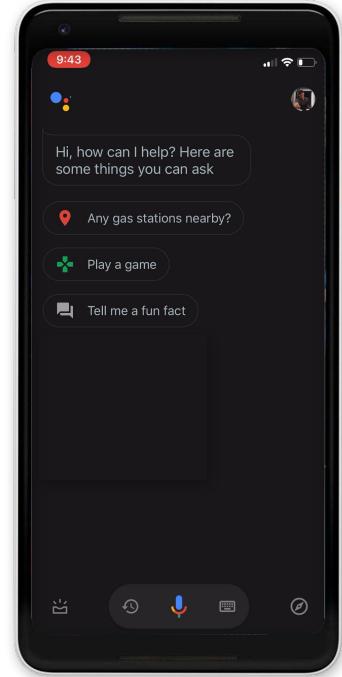
# TinyML for Humans



- More accessible (hands-free)
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- Will it perform reliably across populations?
- Does it threaten the user's privacy?
- Can we protect the user's data?



AI Failures

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# What can we do about it?

**Microsoft's disastrous Tay experiment shows the hidden dangers of AI**

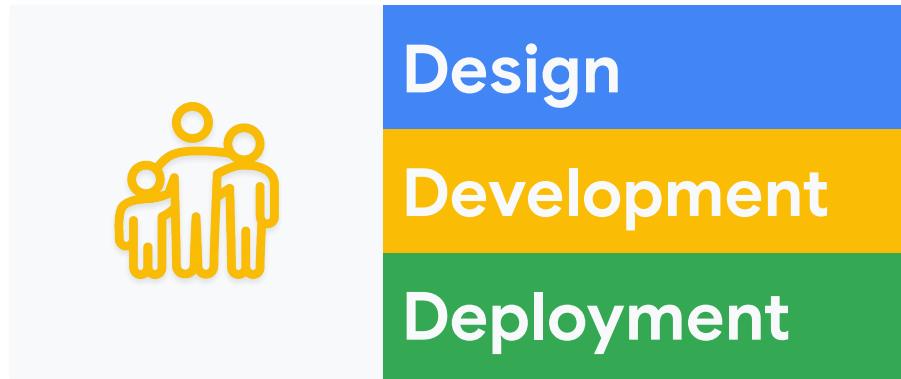
**Google Calls Hidden Microphone in Its Nest Home Security Devices an 'Error'**

**Predictive policing algorithms are racist.  
They need to be dismantled.**



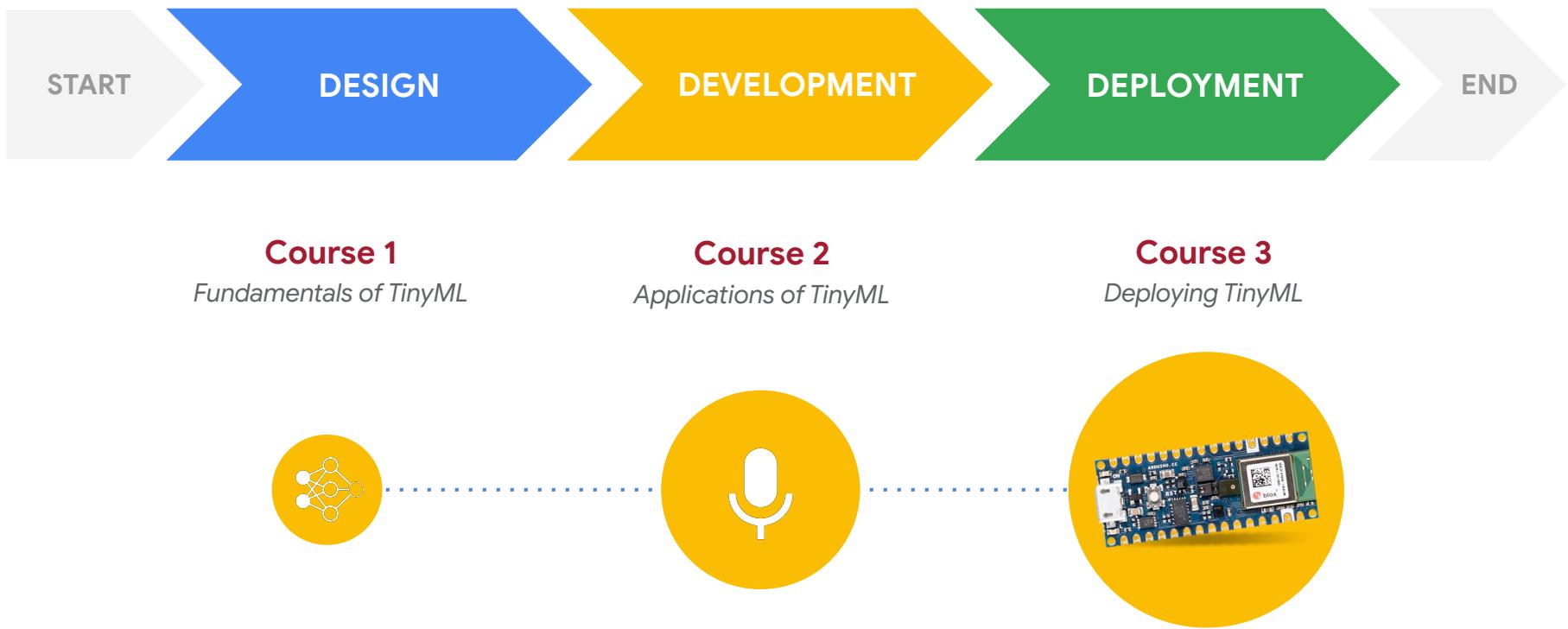
# A New Wave of Innovation—Responsible AI

- There is a growing trend towards creating “**human-centered**” AI
- Ethics is no longer just *reactive* but *proactive*



- This means keeping **human values** in the loop throughout **all stages** of a product’s lifecycle

# Responsible AI: Human-Centered Design



# Responsible AI: Human-Centered Design



## Course 1

*Fundamentals of TinyML*

- **What** am I building?
- **Who** am I building this for?
- What are the **consequences** for the user if it **fails**?

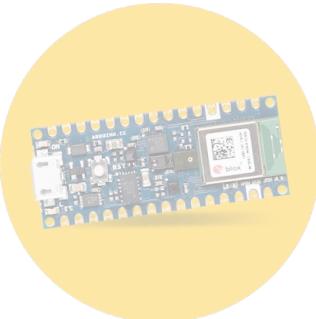
## Course 2

*Applications of TinyML*



## Course 3

*Deploying TinyML*



# Responsible AI: Human-Centered Design



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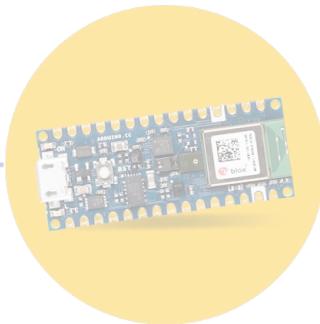
## Course 2

*Applications of TinyML*

- **What data** will be collected to train the model?
- Is the dataset **biased**?
- How can we **ensure** the model is **fair**?

## Course 3

*Deploying TinyML*



# Responsible AI: Human-Centered Design



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*Applications of TinyML*

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## Course 3

*Deploying TinyML*

- How will **model drift** be monitored?
- How should **security breaches** be addressed?
- How should the user's **privacy** be protected?

# Susan Kennedy, Ph. D.

- Dr. Kennedy has a Ph. D. in philosophy with a specialization in applied ethics
- Focuses on the ethical, social, and political impacts of emerging technologies

