# Understanding Digitalization, AI & Machine Learning
## A Guide for Psychologists

**Presented by:** Robert Peterson

Who rembers the first time you logged onto the Internet?

# Definition of Terms

- AI – Artificial Intelligence

- ML – Machine Learning

- Wearables – smart watches, any electronic device that gives information to your health status

- Neural Networks – Using several individual interconnected items that signal one another similar to neuroscience and how the nervous system works

# Why This Matters for Psychology



- Psychology is increasingly intersecting with technology Digital tools impact mental health, behavior tracking, therapy delivery

- AI & ML are transforming diagnosis, assessment, and intervention models

- "Will AI replace Medical Doctors?? No but Medical Doctors with AI will" Dr. Bill Morice Mayo Clinic, CEO Mayo Clinic Laboratories

# What is Digitalization?

- Definition: Converting analog processes to digital systems

- Examples: Paper notes to EHRs, in-person sessions to teletherapy

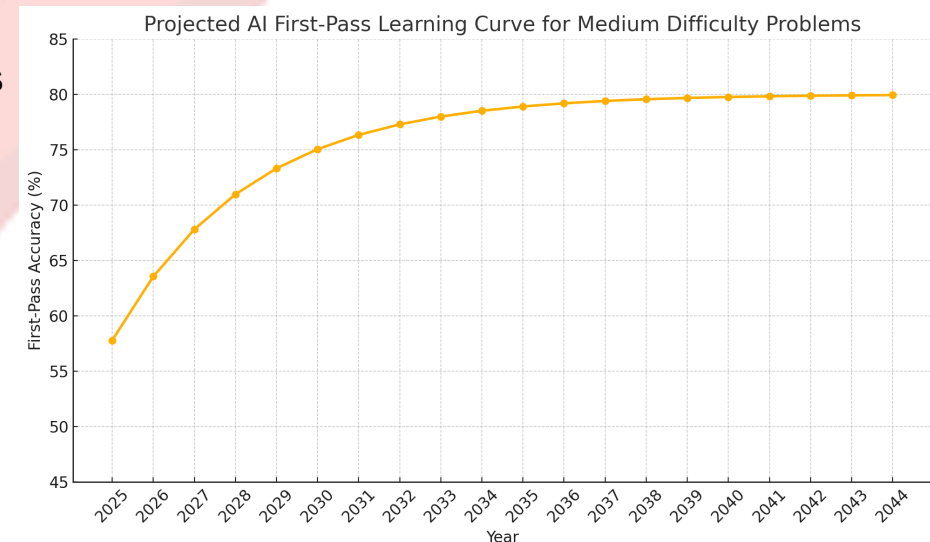- Benefits: Efficiency, access, scalability, data collection

# The Digital Landscape



🐘 **To the Elephant (Memory Master):**

•**Digital** = Shared herd memory over invisible waves.

•**AI** = A system that knows migration routes better than the matriarch.

•**ML** = Learns to optimize watering hole visits over generations.
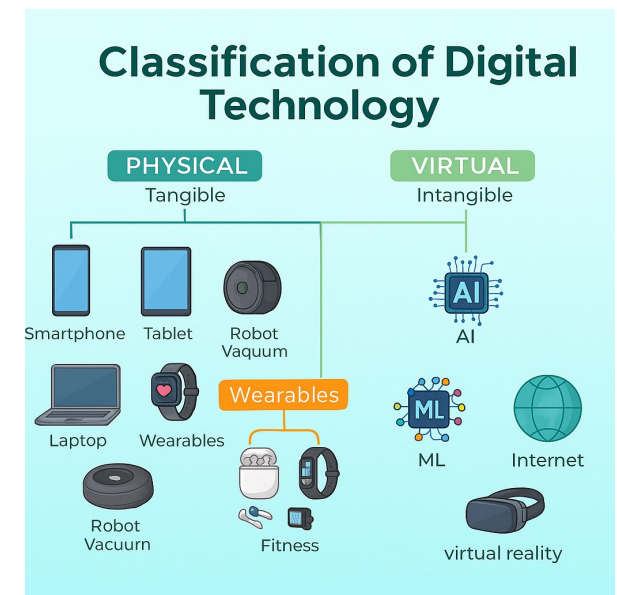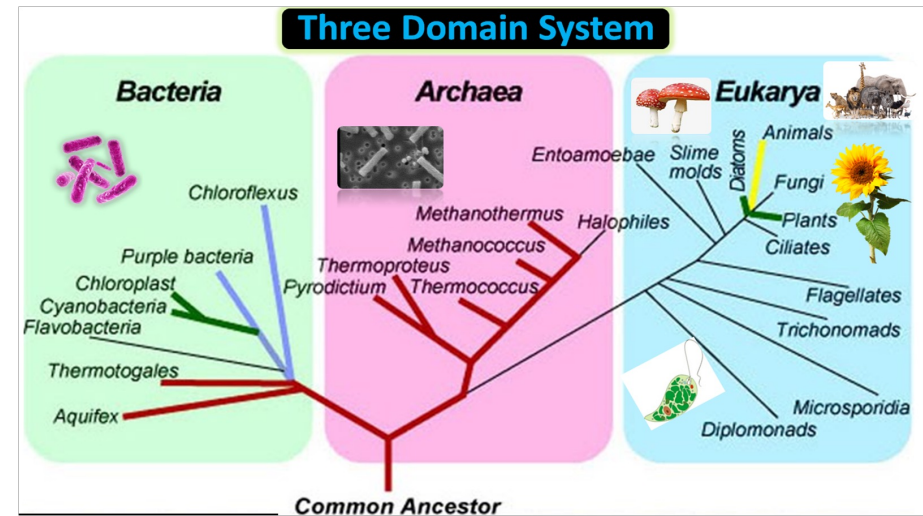
# Assumption:
# Good questions > great answers

- The top AI models currently manage
  - ~ 53% at first pass on medium-difficulty problems
  - ~ 0% high difficulty problems
  - …On which human experts routinely excel (Caiwei Chen, *MIT Technology Review, 2025*)

- "In real-world, application-driven environments—especially with AI agents—unreliability, hallucinations, and brittleness are ruinous. One wrong move could spell disaster when money or safety are on the line." (Zihan Zheng, *N. American Coding Olympiad Finalist, 2025*)



Projected AI First-Pass Learning Curve for Medium Difficulty Problems

**Synonyms?**

# Digital Comparisons



Three Domain System



Classification of Digital Technology

# Wearables and Digital Psychology

- Smartwatches, fitness trackers, digital mental health tools

- Real-time physiological & behavioral data (sleep, heart rate, mood)

- ML detects patterns for early intervention (e.g., signs of depression)

# Artificial Intelligence (AI)

- AI: Simulated human-like intelligence by machines

- Closed Captioning

- Translators

- Examples in psychology:

  - Chatbots for mental health (e.g., Woebot)

  - AI-driven behavioral predictions

  - Decision support in diagnostics

# Machine Learning (ML)

- Subset of AI: Systems learn from data

- Instead of being explicitly programmed, ML models improve over time
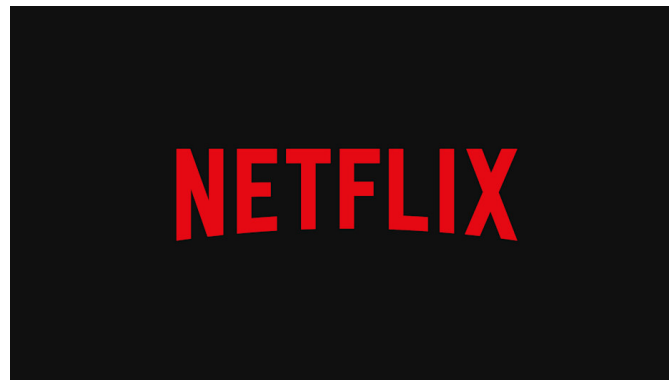
- Example: Predicting relapse risk using therapy session transcripts
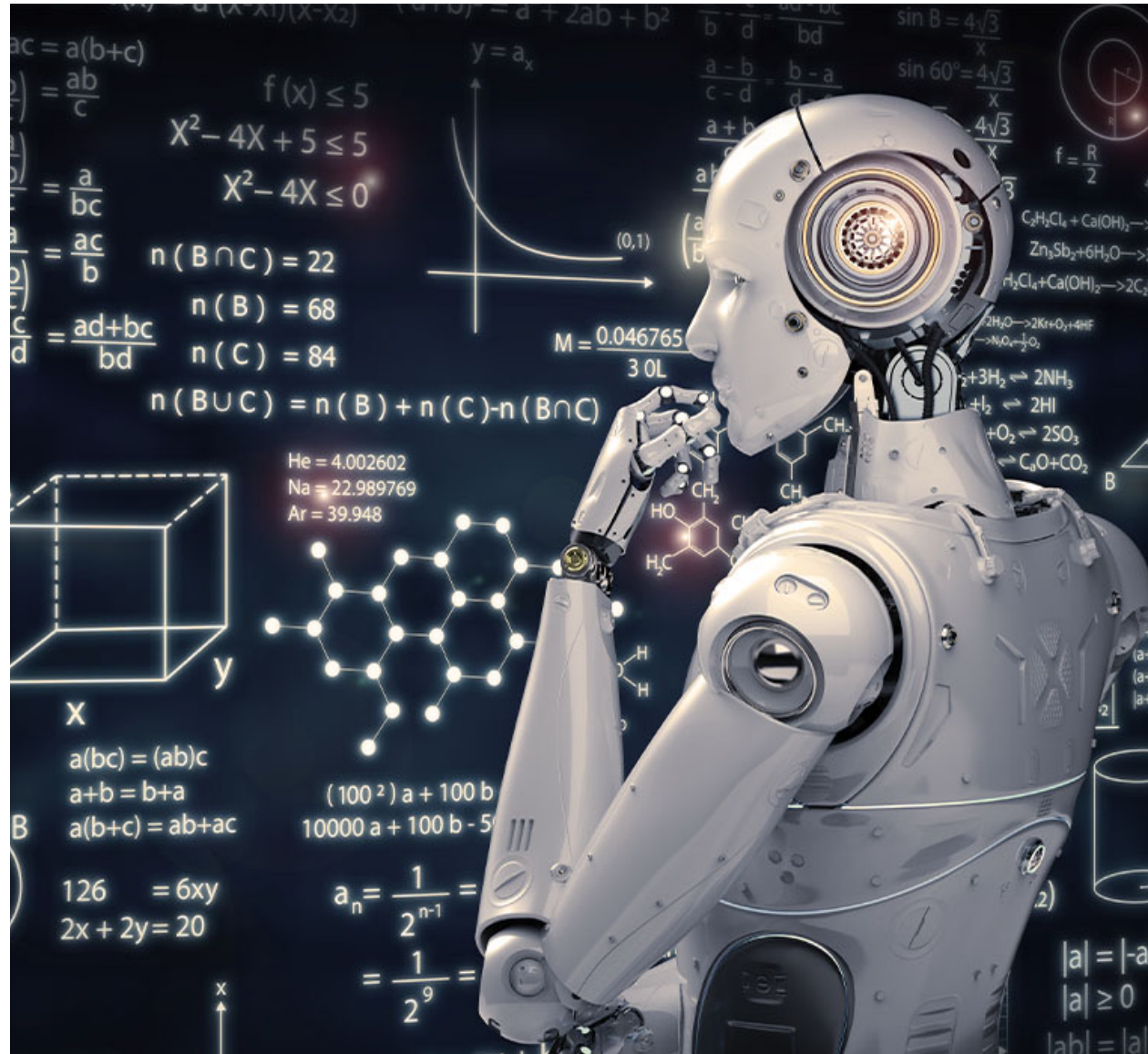
# Types of Machine Learning (ML)

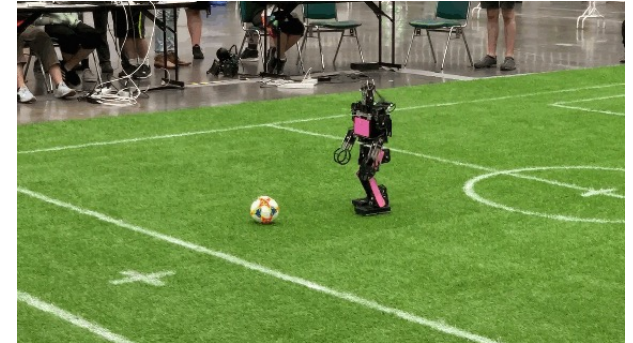1. **ML powers many modern AI applications** like:

   - Voice assistants (e.g., Siri, Alexa)

   - Recommendation systems (e.g., Netflix, Amazon)

   - Autonomous vehicles

   - Mental health apps (e.g., predicting emotional states)

# There are many forms of ML and intelligence level

# How AI & ML Work Together

- AI is the broader concept; ML is one method used to create AI

- Analogy: AI is the goal (like mental wellness), ML is the therapy plan

- In psychology: ML helps AI analyze speech, text, biometrics, outcomes

# What can AI do?

- Ability to provide a transcript

- Analyze speech patterns

- Engagement analysis

# How to get into AI?

deepseek

✳ Claude

ChatGPT

Grok

Gemini

# Are AI models "good"?

- "Solid in different ways"(Caiwei Chen, *MIT Technology Review, 2025*)

- How are AI models evaluated?
  - Benchmarks > measurement tool for AI
    - Fixed set of questions for evaluation
    - "Teach to the test" – high scores x models $\neq$ improvements
      - Knowledge v. intelligence
    - Widespread data contamination (questions and answers)
    - Benchmarks "ceiling out"
      - >90% accuracy statistical noise is *not* model improvement

Is Gemini or DeepSeek better than ChatGPT?

Is the Anthropic (safety focused) model worthwhile?

DO benchmarks mean anything in AI?

Do assessments like LiveCodeBench Pro adqueately address ceiling and floor problem?

Do user questions like LMarena solve benchmark issues via comparison?

**ChatGPT**

| Version | Model | Key Features | Limitations | Pro Subscription | Release Period |
|---------|-------|--------------|-------------|------------------|----------------|
| 1.0 | GPT-3.5 | Basic QA, summary, conversation | Weak reasoning, no tools | No Pro tier | Nov 2022 – Jan 2023 |
| 2.0 | GPT-3.5-Turbo | Faster, cheaper, same base capability | No vision or interactivity | $20/month | Feb 2023 |
| 3.0 | GPT-4 | Strong reasoning, early memory rollout | Slower, expensive | $20/month | Mar-May 2023 |
| 4.0 | GPT-4 Turbo | Tools, images, memory, custom GPTs, 128K context | Still hallucinates, limited autonomy | $20/month | Nov 2023 - Present |
| 5.0 | GPT-5 | AI agent capabilities, stronger multimodal fluency | Not yet released. | $20-40/month | Expected Jul 2025 |

# Ethical and Practical Considerations



- Privacy and consent

- Algorithmic bias and fairness

- Therapist–AI collaboration, not replacement

- Importance of human oversight

What are psychologists saying about AI?

# The great divide

AI Have & Have Nots

# The Global A.I. Divide

**WHERE A.I. DATA CENTERS ARE LOCATED**

Only 32 nations, mostly in the Northern Hemisphere, have A.I.-specialized data centers.
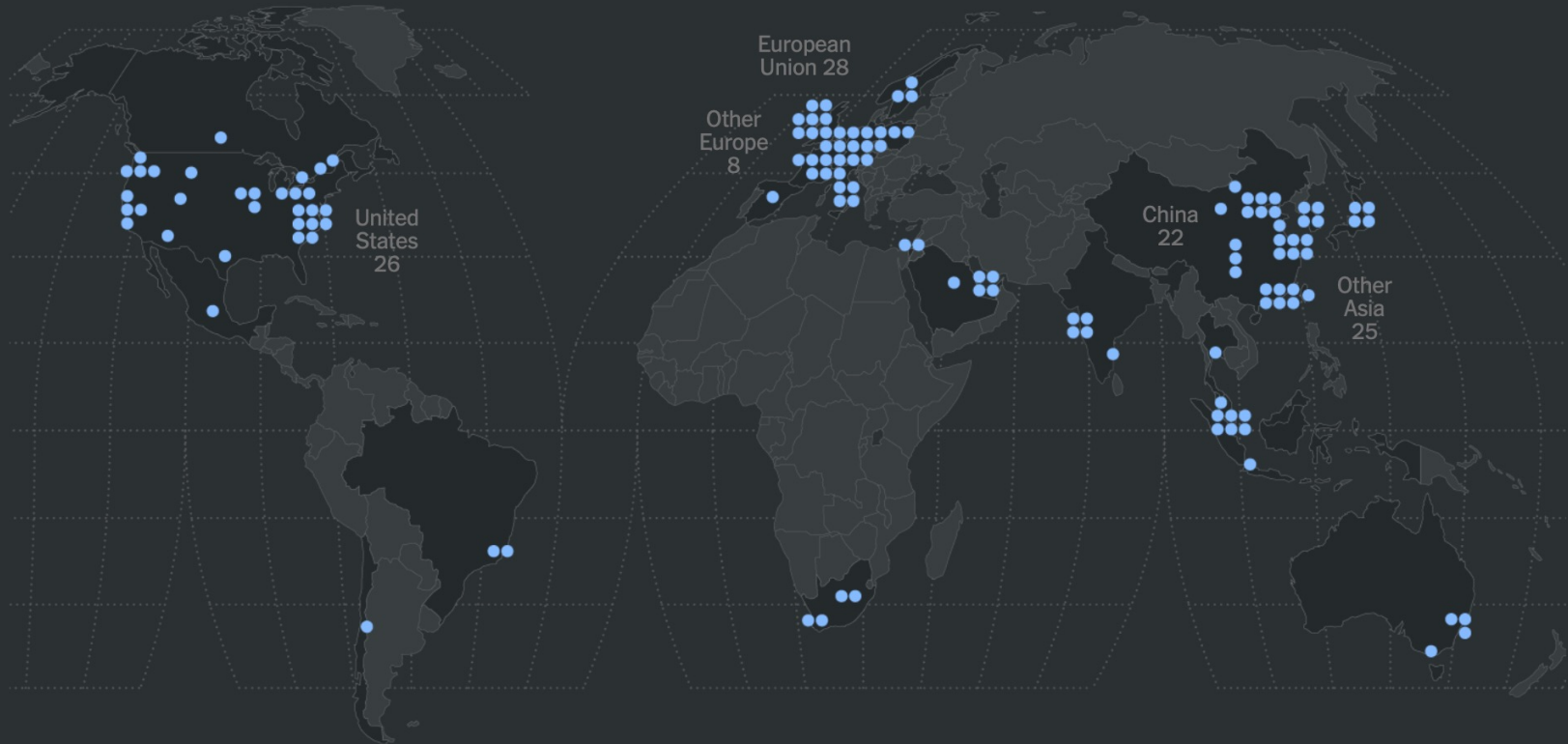
What are psychologists saying about AI?

European Union 28

Other Europe 8

United States 26

China 22

Other Asia 25

# Tech Layer



**Tech**

# Psychological Concept



Psychology
s y m b o l
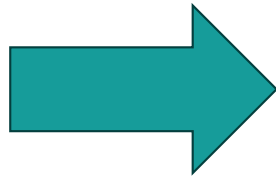
Digital

AI

Machine Learning

Wearables

Combined Impact



Communication, attention, awareness

Decision-making, modeling cognition

Learning through feedback, behaviorism

Self-tracking, biofeedback, emotional insight

Enhanced self-regulation, habit formation, predictive behavior change

# The Future of Psychology + Technology

- Personalized mental health care

- Scalable solutions for underserved populations

- Real-time monitoring and adaptive interventions

- Psychologists shaping responsible AI design

- Thinks with you not for you – Anthropic Claude AI

# How Psychologists Can Engage

- Learn the basics of data and algorithms

- Collaborate with technologists on tool development

- Use digital tools as adjuncts, not replacements

- Advocate for ethical standards in AI

# Simple right?

## Q&A / Discussion

- Open floor for questions

- Invite feedback, concerns, and collaboration ideas