Lecture No. 1

■ Summary

- Artificial intelligence (AI) and machine learning are key topics

- Deep learning plays a role in these areas

- An explosion of generative AI involving large language models and chat Bots has occurred

- The evolution of AI technology has progressed over the years, and expert systems were po pular in the 1980s and 90s

- Machine learning involves observing patterns and discovering outliers

- It's particularly useful in cybersecurity for identifying abnormal system usage

■ Key Terms and Concepts

- Artificial intelligence

- Machine learning

- Deep learning

- Generative AI

- Large language models

- Chat Bots

- Expert systems

- Outliers

- Training data

- Prediction

- Cybersecurity

■ Review Questions

1. What is the difference between artificial intelligence, machine learning, and deep lear ning?

2. How has AI technology evolved over the years, and what role have expert systems played?

3. What are the key capabilities of a machine learning algorithm?

4. Why is machine learning useful for cybersecurity and what are its common applications i
n that domain?

■ Summary

- Machine learning and deep learning are now popular and have matured greatly over the las
t few decades.

- Deep learning uses neural networks to simulate the way the human brain works.

- Deep learning involves multiple layers of neural networks, making it hard to fully under
stand the results.

- Foundation models, like large language models, use language to predict sentences, paragr
aphs, and entire documents.

- Generative AI encompasses models that generate new content by recombining existing infor
mation.

- The controversial use of generative AI includes deep fakes, which can create fake conten
t of people's voices, and other entertainments applications.

■ Key Terms and Concepts

- Machine learning

- Deep learning

- Neural networks

- Foundation models

- Generative AI

- Deep fakes

■ Review Questions

1. What are the key differences between machine learning and deep learning?

2. How does a deep learning neural network function to simulate the human brain?

3. What are foundation models and what is a specific example of it?

4. Describe the concept of generative AI and provide an example of its controversial use.

5. How can deep fakes affect the way we perceive media and entertainment?

■ Summary

- Artificial Intelligence (AI) adoption started slowly but has become widespread.

- Machine learning, deep learning, and advanced AI models have accelerated AI adoption.

- Foundation models like GPT-3 have changed the adoption curve and led to widespread AI us e.

- It is important to understand where AI fits in and how to reap its benefits.

■ Key Terms and Concepts

- Artificial Intelligence (AI) adoption

- Machine learning

- Deep learning

- Foundation models

- GPT-3

- Adoption curve

■ Review Questions

1. What factors contributed to the widespread adoption of AI?

2. How have foundation models like GPT-3 changed the adoption curve of AI?

3. Why is it important to understand where AI fits in and how to reap its benefits?