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# Automated Lecture Generator

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# Problem Statement and Analysis

## Problem Statement:

- The e-learning spike calls for rapid, efficient lecture production.
- Content creation can't keep pace with online learning growth.

## Market Analysis:

- After COVID, platforms like Coursera experienced a marked rise in users
- Forbes indicates a permanent shift to e-learning.

## Implications:

- Conventional lecture methods are too slow for current demands.
- Automation emerges as a solution



# Objective & Features

## Objective:

- Automate the creation of audio lectures from syllabus.

## Personalization:

- Delivery style of professors is retained.

## Efficiency:

- Automate the course material creation.
- Minimize the lecture creation time.

## Accessibility:

- Facilitate more widespread access to e-learning.
- Creation of lectures in multiple languages.



# Use Case Scenarios

- Saves professors' time in generating lectures
- Makes lectures available in different languages keeping the human aspect of audio.
- Allows students to get a better understanding of a course based on syllabus access
- Can be utilized by online course creators
- Access to remote education during crisis situations or in areas with low connectivity



# AI Algorithm and Model (LLM)



## LLaMA-2

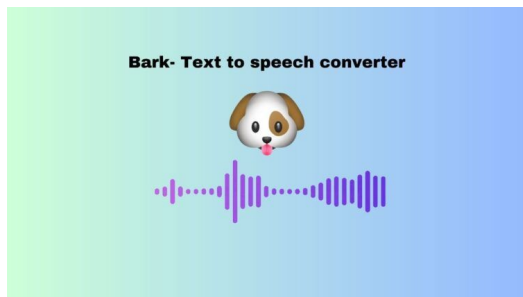
- Open source AI model
- Produces high-quality, coherent lecture content
- **13B-Parameter Model:**
  - Chosen for its balance of computational efficiency and depth of language understanding
- **Real-Time Processing:**
  - Capable of generating content dynamically, reflecting the fluid nature of lectures
- **Optimization Configurations:**
  - *GPU Layers:* 130 layers for balanced speed and accuracy
  - *Repetition Penalty:* 1.1 to minimize redundancy and enhance uniqueness
  - *Temperature:* Set at 0.1 for precise, topic-focused content



# AI Algorithm and Model (TTS)

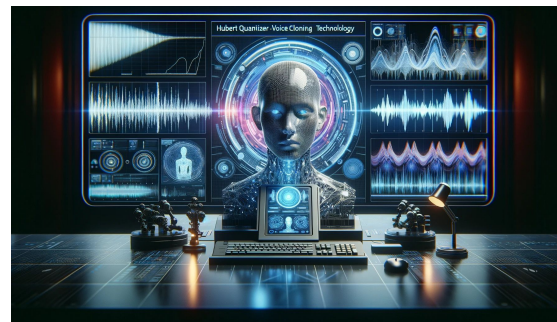
## Bark - Suno Text-to-Audio Model

- Converts scripts to lectures
- Trained with human voices.
- Expressive audio with pauses and music
- Multilingual support



## Hubert Quantizer - Advanced Voice Cloning

- Replicates educator's speech patterns
- Trained on diverse voiceovers
- Delivers authentic, emotive vocal performance



# Demo

# Results

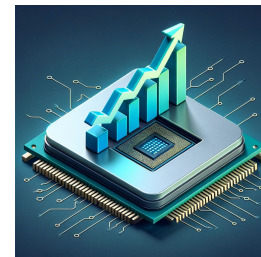
- The LLaMA-2 model successfully creates lecture scripts from the syllabus
- The Hubert Quantizer creates embedding for cloning custom voices
- Bark uses these embeddings to create lectures
- The project also enables creation of the same lecture in multiple languages.
- The lecture incorporates human expressions like pauses and silence.



# Lessons Learned

## 1. Computational Power

- Switched to Google Colab Pro for better performance and cost-effective LLaMA-2 over OpenAI.



## 2. Language and Accent Recognition

- Bark's Corpus tailored for select accents, not diverse due to data limits.



## 3. Voice Cloning Requirements

- Voice Cloning: Needs high quality recordings, 30 sec audio takes 5 min with advanced GPUs.



# Thank you!

# Any Questions?

Please post any questions on Piazza.

# Sources

Hamilton, Ilana. “By the Numbers: The Rise of Online Learning in the U.S.” *Forbes*, Forbes Magazine, 27 Sept. 2023, [www.forbes.com/advisor/education/online-learning-stats/](https://www.forbes.com/advisor/education/online-learning-stats/).