



SUMMIT
ONLINE

Virtual rap battles

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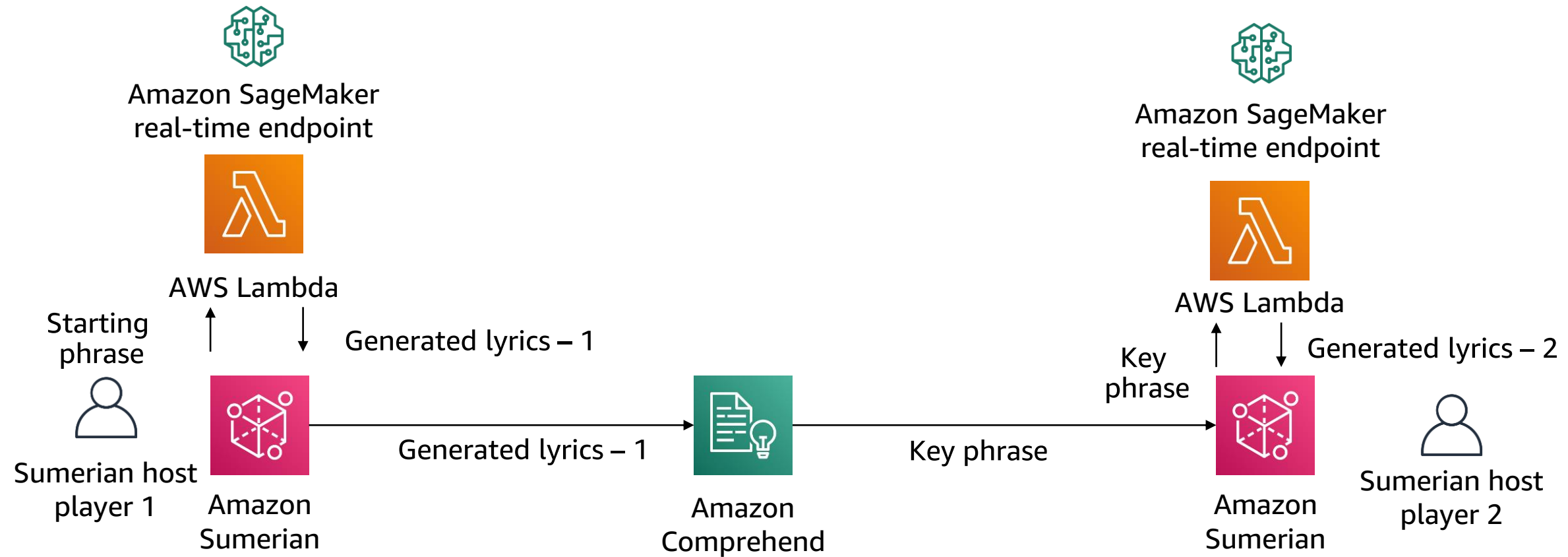
Problem statement

- Artificial intelligence is quickly making inroads into the Entertainment industry in areas ranging from creating music loops, paintings, drum track samples, and entire heavy metal albums to generating lyrics
- Natural language generation (NLG) has the potential to create entirely new forms of art
- We will create two virtual rappers and have them trade rhymes with each other, almost like in real life

Demo of the actual solution

Credit: Girish Nair, Enterprise Solutions Architect

Architecture diagram



Machine learning (ML) algorithms for text generation

- Markov chains
- Recurrent neural networks (RNNs)
- Long short-term memory (LSTM)
- Transformers

Character RNNs using LSTM

- RNNs can be used as generative models
- We will give the RNN a corpus of text (lyrics) and ask it to model the probability distribution of the next character in the sequence given a sequence of previous characters
- In addition to being used for predictive models (making predictions), RNNs can learn the sequences of a problem and then generate entirely new plausible sequences for the problem domain

Amazon SageMaker: Bring your own container

- If there is no prebuilt Amazon SageMaker container image that you can use or modify for an advanced scenario, you can package your own script or algorithm to use with Amazon SageMaker
- You can use any programming language or framework to develop your container
- We will use this approach to train a character RNN using PyTorch, as it is not natively available in Amazon SageMaker

Amazon Comprehend

- Amazon Comprehend is a natural language processing (NLP) service that uses ML to find insights and relationships in text – no ML experience required
- Amazon Comprehend uses ML to help you uncover insights and relationships in your unstructured data
- We will use the key phrase detection feature of the service

Amazon Sumerian

- Sumerian is a managed service that lets you create and run 3D, augmented reality (AR), and virtual reality (VR) applications
- You can build immersive and interactive scenes that run on AR and VR, mobile devices, and your web browser
- You can design scenes directly from your browser and, because Sumerian is a web-based application, you can quickly add connections in your scenes to existing AWS services

Amazon Sumerian hosts

- Sumerian hosts are AI-driven animated characters that can be added to your scene
- You can customize the host's characteristics, such as gender, appearance, clothing, voice, and language
- Using Sumerian's integration with [Amazon Lex](#) and [Amazon Polly](#), you can enable engaging spoken interactions between hosts and your users
- Amazon Polly lets you input text that your host can speak in lifelike voices and a variety of languages

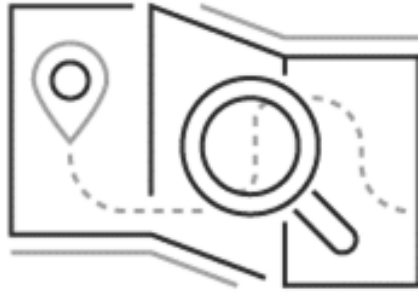
Demo: Amazon SageMaker and AWS Lambda

Conclusion

- Conversational interfaces between humans and machines are constantly evolving
- This evolution can push the frontiers of what creativity or art is supposed to be
- You can use this kind of framework to plug in various algorithms and see which ones give you better results
- And yes, it helps you have some fun with ML!

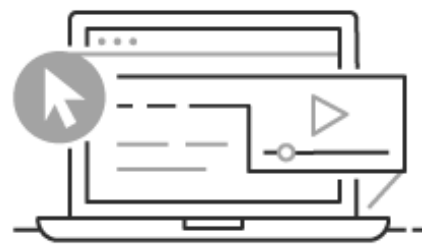
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