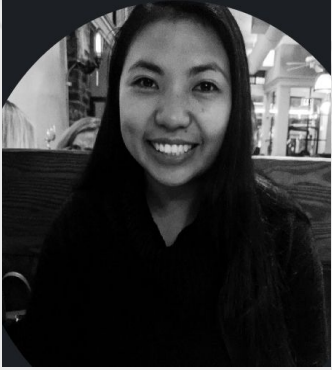


if-then.nexus

GenAI-augmented Interactive Fiction Collaborative Gamified Prototyping System

Capstone Data Science 210 – Section 1 – Final Presentation
Frances Cue - Bennett Davis - Conner Davis - Michael Guldberg
10 December 2024

if-then.nexus_team



Frances Cue

- Project/Product Management
- Machine Learning and Prompt Engineer
- Research and Development



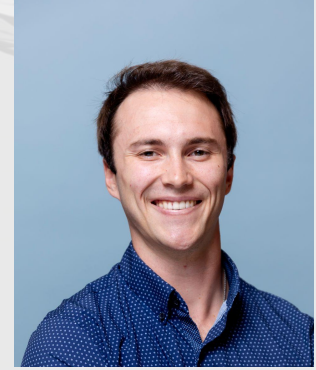
Conner Davis

- Project/Product Management
- Machine Learning Engineer
- Research and Development
- AWS and Hugging Face



Bennett Davis

- Front-End Engineer
- Prototyping
- System and Infrastructure Engineer
- Industry Relations
- Research and Development



Michael Guldberg

- Machine Learning Engineer and Prompt Engineer
- Exploratory Data Analysis
- Research and Development

problem + impact - small / indie.developer

- Need for collaborative, open source tool for non-linear storytelling.
- Need for Generative AI to assist the storyteller in the storytelling process.
- For fledgling independent developers, the cost of large scale development is insurmountable.
- Small shops are faced with having to do more with less.
- Ideation and narrative are at the core of interactive gaming.

game.industry + AI

- Global video game market - 200 billion. (Steam PC gaming platform - 9 billion)
 - Online and offline console, mobile, and PC games.
- Developers are using AI, especially smaller studios.
 - **49%** said GenAI is being used in their studio .
(31% by themselves, 18% by colleagues) – 15% not yet, but interested
 - Developers at **indie studios almost twice as likely** to use GenAI.
 - **84% concerned** about the ethics and industry impact of generative AI
 - Most prefer AI help with processes, scheduling, and production tooling vs. creative work.

Sources: GDC 2024 State of the Game Industry Report – <https://reg.gdconf.com/state-of-game-industry-2024>

What AI Can, Can't, and Shouldn't Do for Games - John Romero, C3 Dev Fest 2024 – <https://www.youtube.com/watch?v=ONNZQzqwmBg>

Global PC Games Market Report 2024, 2024-01-03 – <https://vginsights.com/insights/article/global-pc-games-market-report-2024>

Video Game Market Size, Share & Trends Analysis Report – <https://www.grandviewresearch.com/industry-analysis/video-game-market>

International Box Office 2023, 2024-09-11 – <https://deadline.com/2024/01/international-box-office-2023-global-studio-rankings-market-share-1235709538/>

domain-experts weigh.in

- Use AI in production tooling to help with non-creative tasks to preserve the creative flow
 - **Brad Taylor**
- Analog cork boards, endless canvas digital boards for collaboration
 - **Punn Wiantrakoon**
- Gameplay is the focus
 - **John Romero**
- The biggest risk in GenAI adoption is not keeping up
- Prompting is a new form of creative expression for the writer
 - **Themed Entertainment Assoc. Round Table Panel**

target.users

enterprise.level

Customizable
Models

If-Then.nexus
Interface

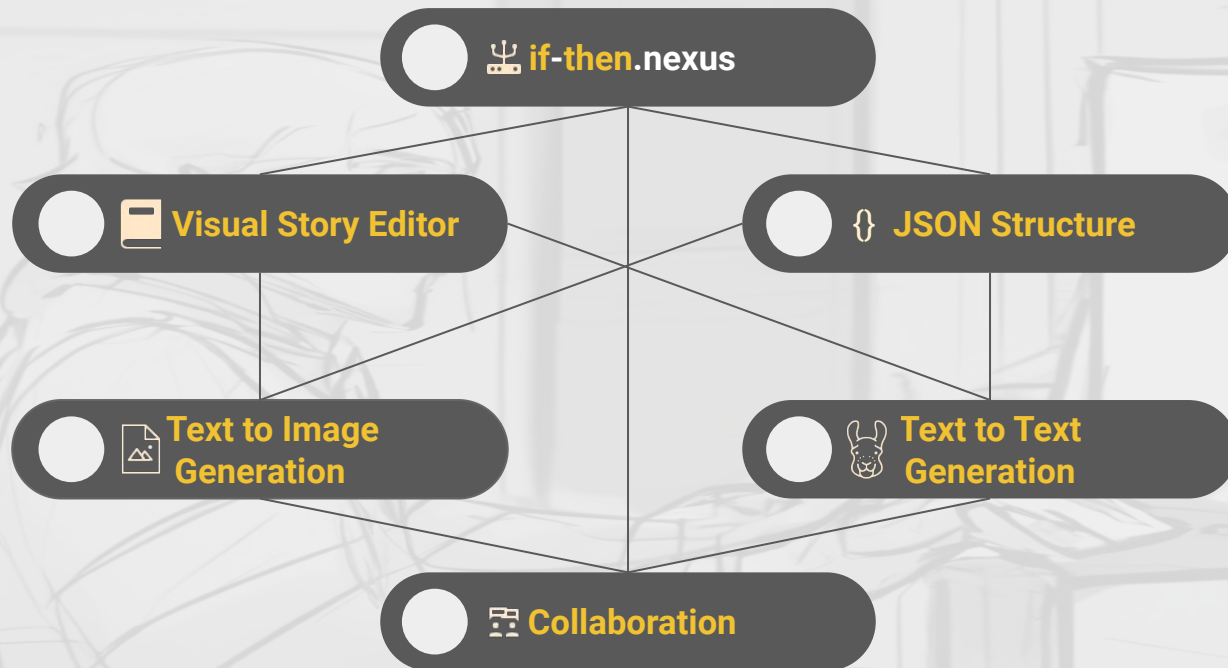
api.models

sandbox.level

Base Models

mvp-prototype:

to create a user-friendly production tool that enables collaboration and play during prototyping, to capture innovative ideas and compelling storytelling



mvp-live.demo



user-feedback from industry.experts

Roland.Dubois
(Product Designer/
Startup Founder)

Wolff.Dobson
(Google developer
programs engineer)

Brian.Sanchez
(Assistant Professor
Animation, Game Art)

Brad.Taylor
(Game Developer)

Successful

Improvement

story.editor

text-to-image

game.portability

collaboration

model.choice - text.to.text

llama 3.1B High
Performing
multilingual.model

hugging_face.API

no.fine
tuning
needed

dialogue

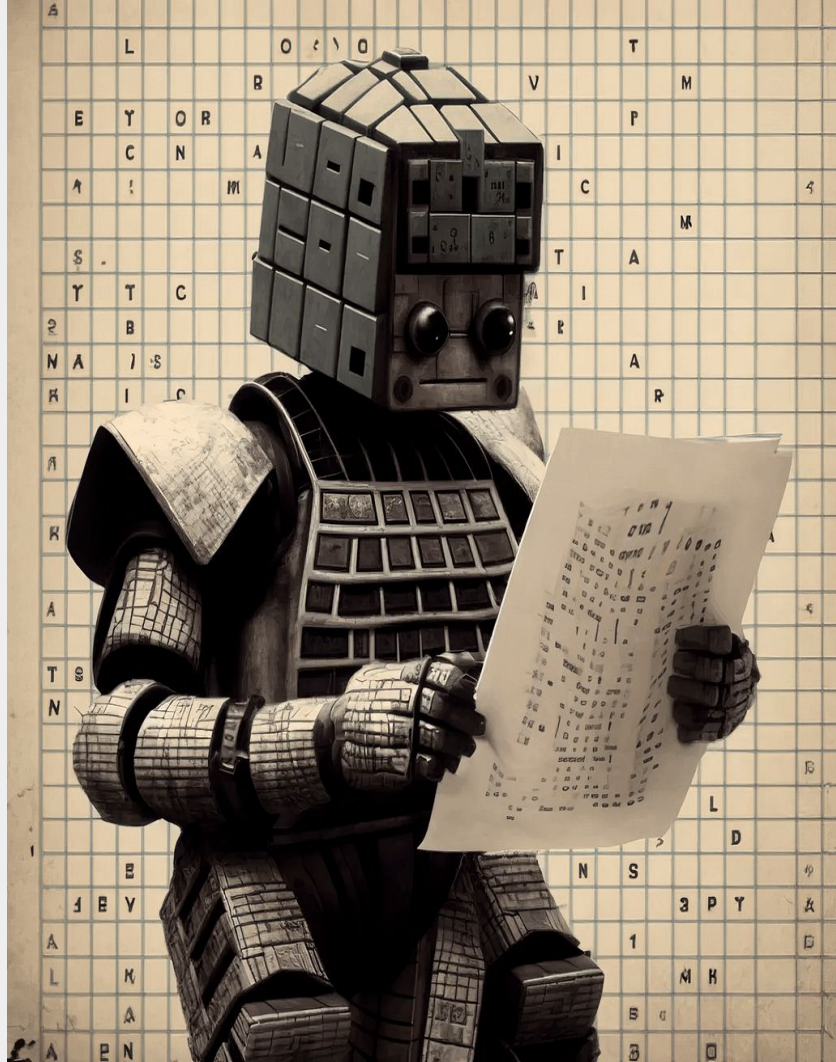
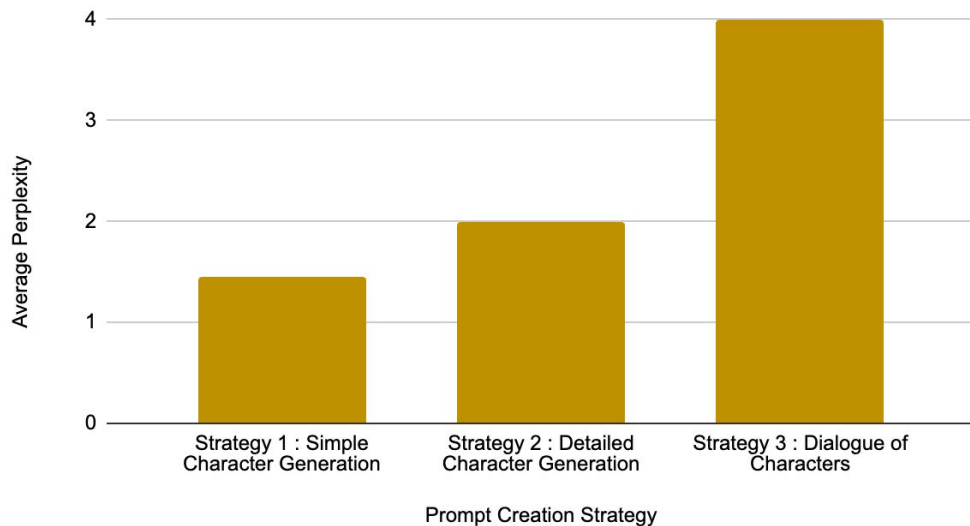
characters

usage.of_items

Character.generation

llama-perplexity Evaluation

Average Perplexity vs. Prompt Creation Strategy



model.choice - text.to.image

Model Name	Size	Description
Adobe Firefly	Unknown	Marketed towards creators
stable-diffusion-xl-base	6.6B	Image generation LLM serving as the base for many image generation models
storyboard-sketch	~6.6B	LoRA adaptation of stable-diffusion-xl-base

Storyboard-Sketch CLIP.evaluation

Arctic Research Station



Arctic Research Station - 0.2005

Tropical Rainforest Biodome - 0.0000

Space Station Command Center - 0.0003

Luxury Beachfront Resort - 0.0000

Underground Data Center - 0.0006

Deserted Island Refuge - 0.0026

Medieval Castle Dungeon - 0.0000

Urban Rooftop Garden - 0.0000

Virtual Reality Theme Park - 0.0004

Deep-Sea Exploration Base - 0.0020

Mountain Peak Observatory - 0.0003

Suburban Craft Brewery - 0.0000

Underground Parking Lot - 0.0009

Rural Vineyard Estate - 0.0000

Abandoned Amusement Park - 0.0000

Intergalactic Trading Hub - 0.0012

Floating Market on a River - 0.0000

Private Island Villa - 0.0000

Ancient Forest Clearing - 0.0001

Underground Metro Station - 0.0000

Cultural Heritage Museum - 0.0000

Rooftop Helipad Lounge - 0.0000

Alien Desert Colony - 0.2109

Urban Sports Complex - 0.0000

Mystic Cavern Network - 0.0016

Snow-Covered Village - 0.0032

Luxury Space Yacht - 0.0000

Industrial Shipping Yard - 0.0000

Forest Ranger Cabin - 0.0000

Artisanal Chocolate Factory - 0.0000

Underground Bunker - 0.0034

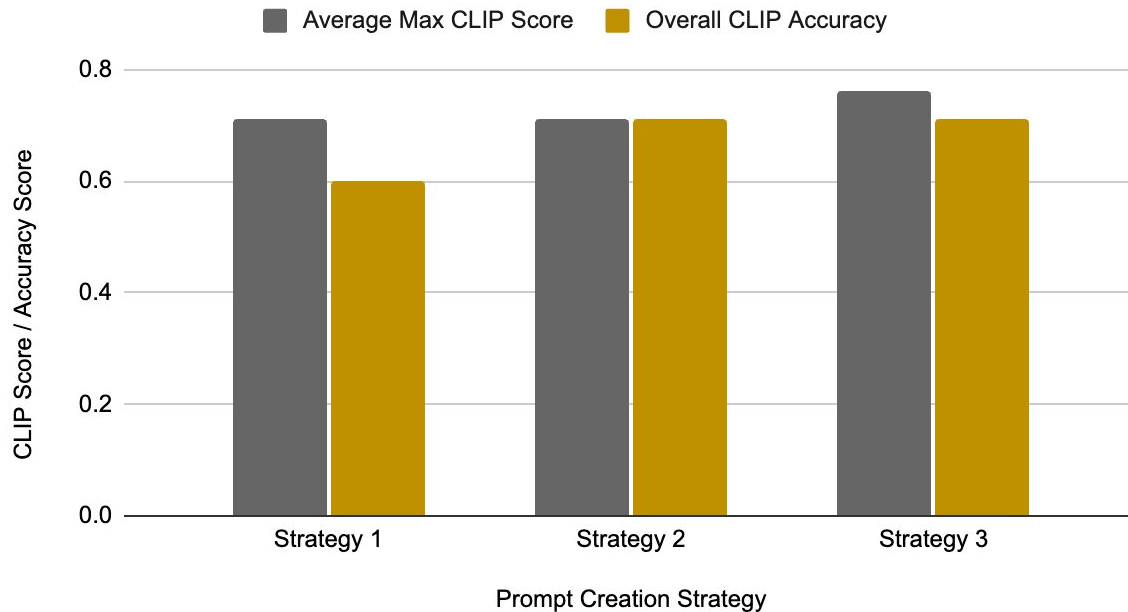
Futuristic Shopping District - 0.0002

Remote Outpost on Mars - 0.5715

Submerged Ruins Dive Site - 0.0000

Storyboard-Sketch CLIP.evaluation

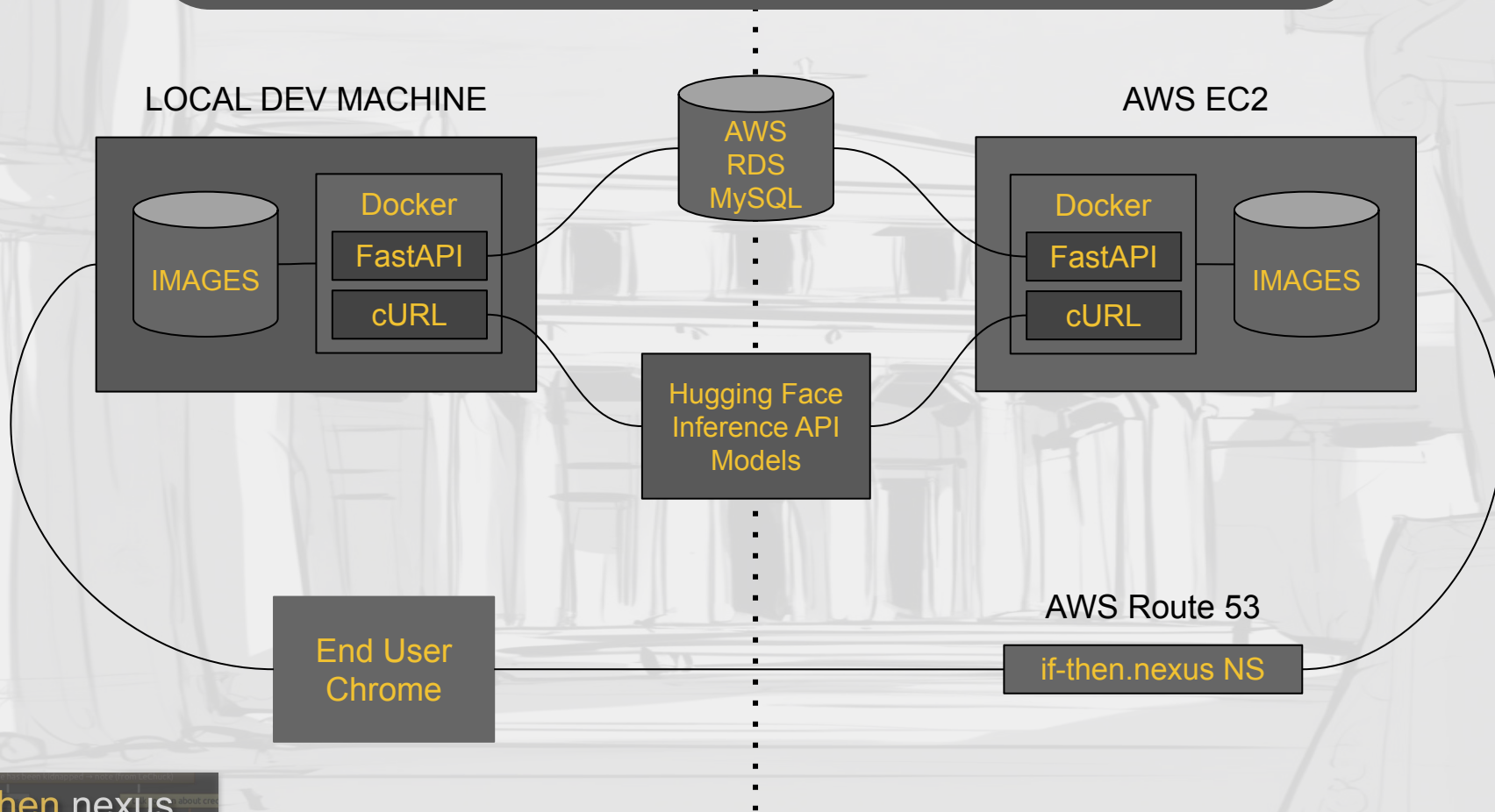
Average Max CLIP Score and Overall CLIP Accuracy



mvp-live.demo



architecture.diagram – if-then.nexus



technical.challenges - retrospective

adobe.firefly

aws.difficulties

to.fine-tune or not.to.fine-tune

roadmap.items

```
graph TD; A[roadmap.items] --- B[improve.stability]; A --- C[collaboration.improve]; A --- D[output.format];
```

improve.stability

- Bugs
- Code optimization
- Security enhancements (XSS and validation)

collaboration.improve

- Tagging (task scoping),
- Email alerts,
- Github integration
- Jira story integration

output.format

- Transcoding JSON into input format for game engines
- Game portability

final_presentation.conclusion

Our mission is to create a user-friendly production tool that enables collaboration and play during prototyping, to capture innovative ideas and compelling storytelling.

