

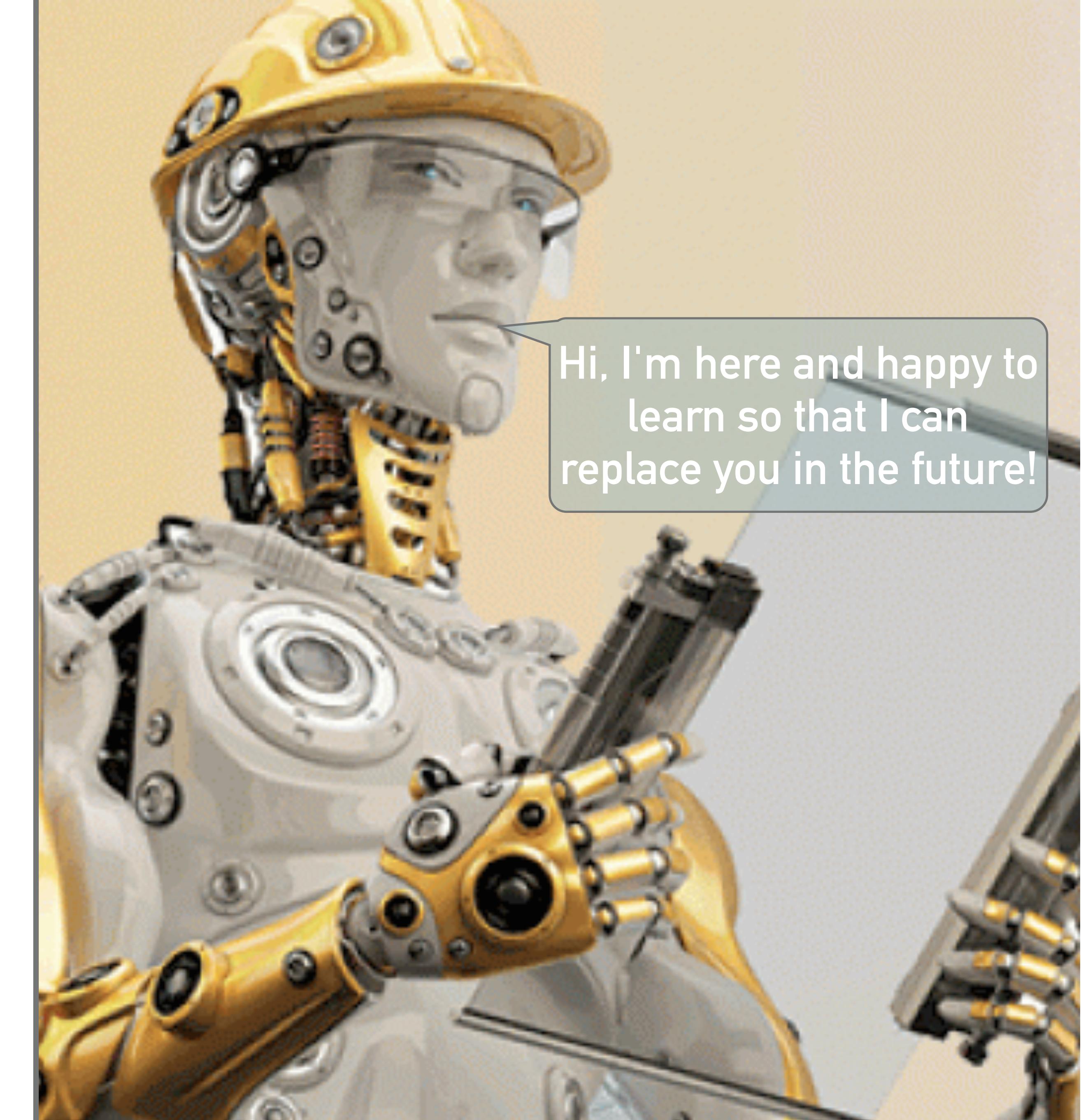


VRND CAPSTONE - ROBO REPLACEMENTS

Eric Zavesky - May-June 2018 - Game Planning

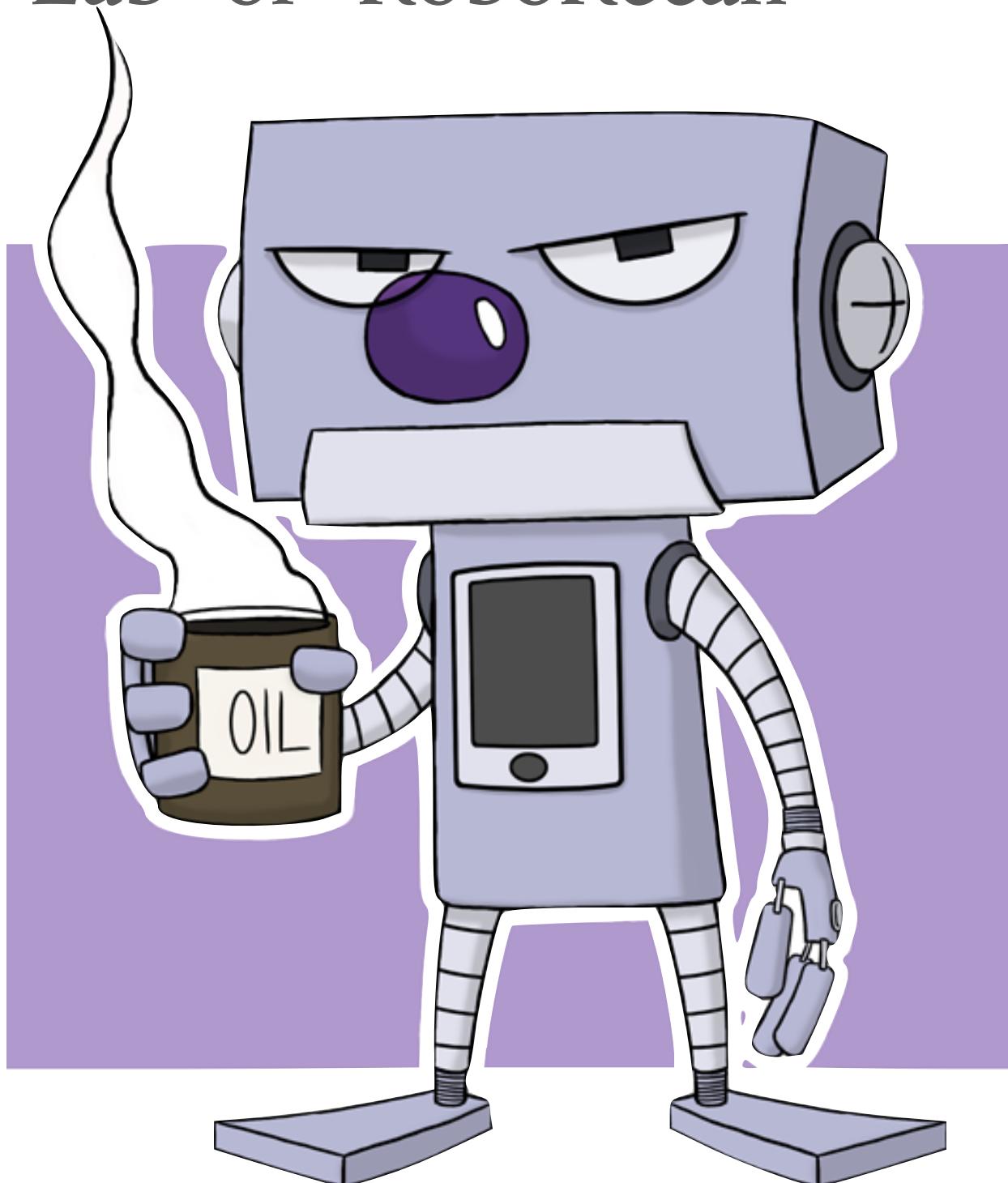
DESCRIPTION

- This capstone will explore the emotive side of robotic automation -- mostly focused on humor, curiosity, and surprise!
- The player's task will be to teach a robot (upper half of a robot avatar) how to accomplish a few simple tasks by demonstration and vocal commands.
- Doing/Listening, Seeing, Speaking
- The focus of this application will be the gameplay and robot interaction, as opposed to extensive graphical interactions.



GAMEPLAY

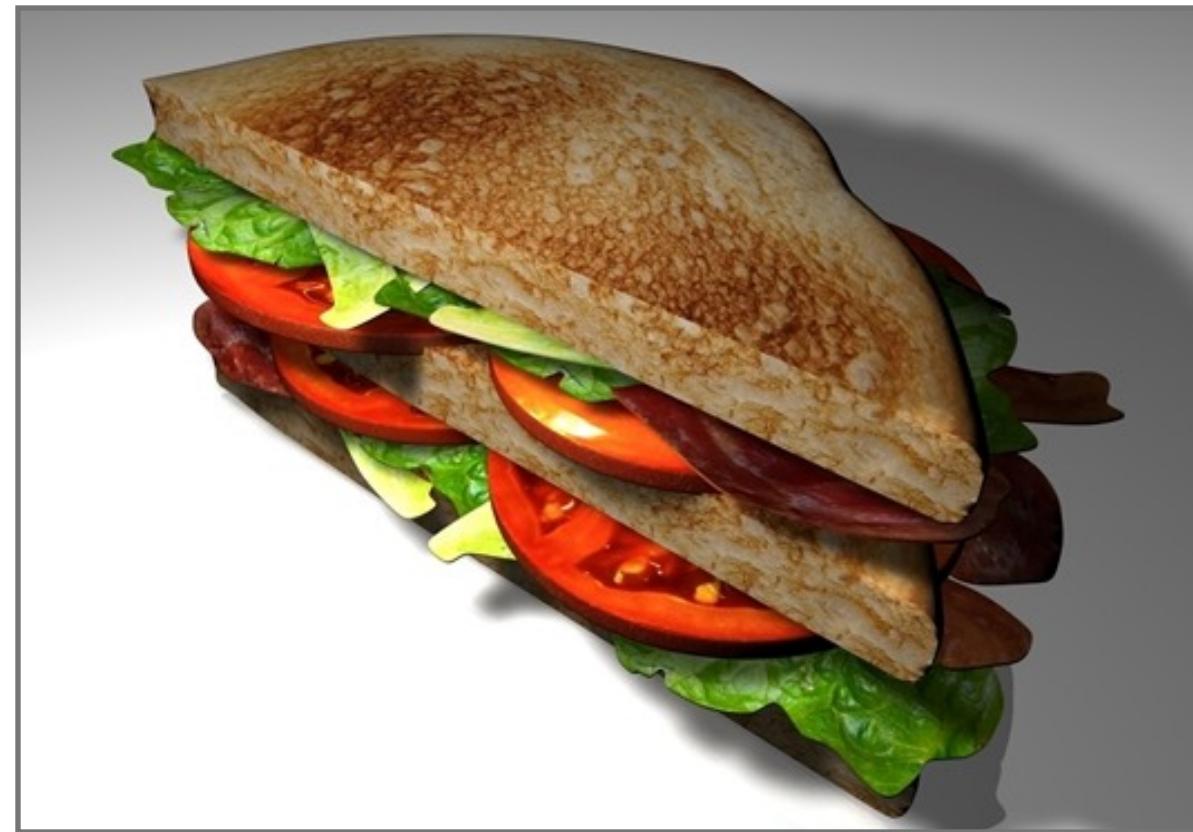
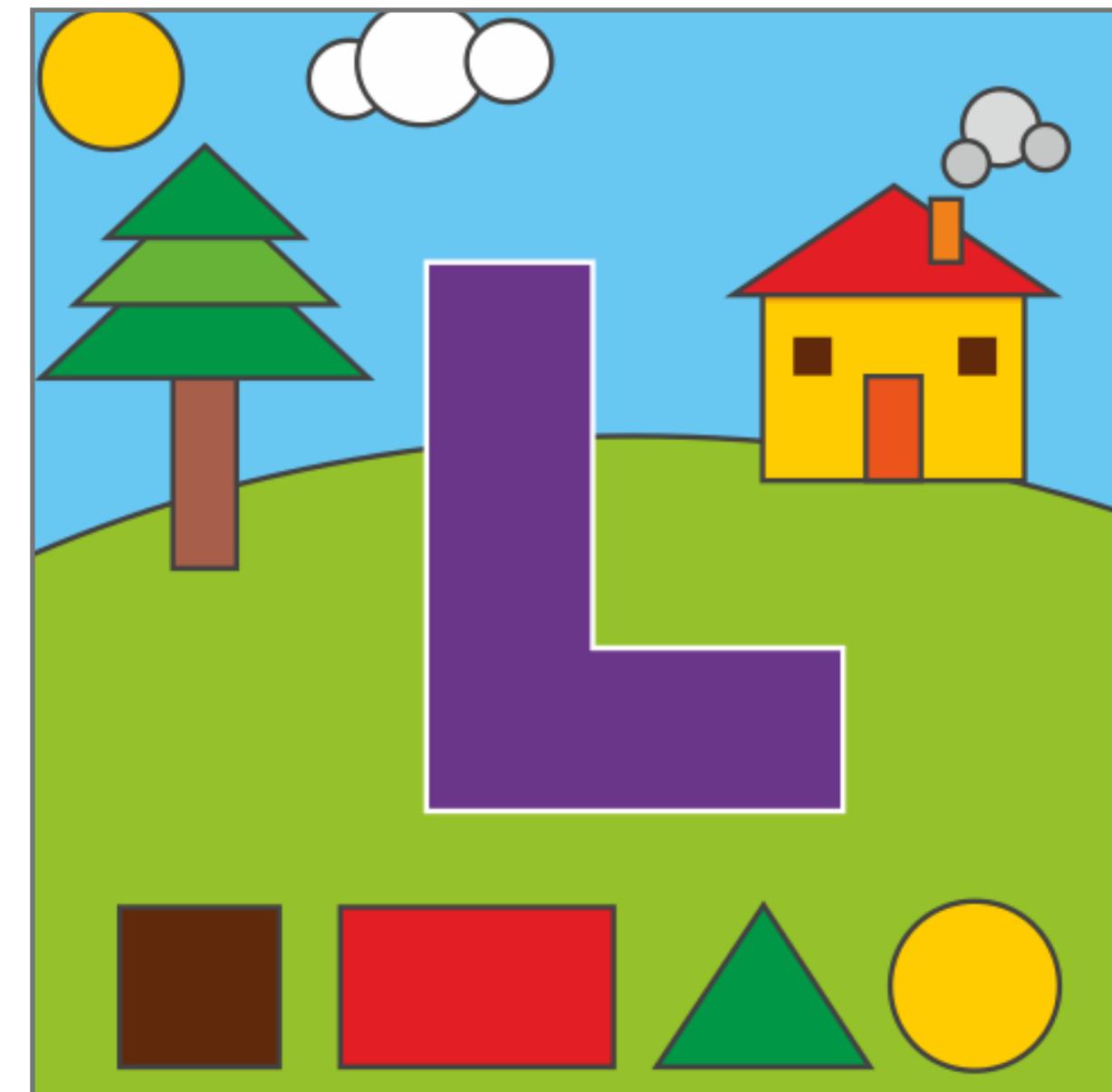
- Task Review
 - Doing/Listening, Seeing, Speaking
 - Robot interjects satirical, comical commentary, a la dialog from games like "The Lab" or "RoboRecall"



- Doing Task
 - goal: using simple interaction mechanics, move to make a sandwich
 - Robot copies user movements
 - User orders task
- Seeing Task
 - goal: teach the robot how to see different items (house, car, flower)
 - user places item on table, robot classifies them online (AI/ML component)
- Listening/Speaking Task
 - goal: user helps robot with speech recognition to complete a "MadLib"
 - ideally pre-programmed animations will bring in media that adjusts according to a few options presented to the user

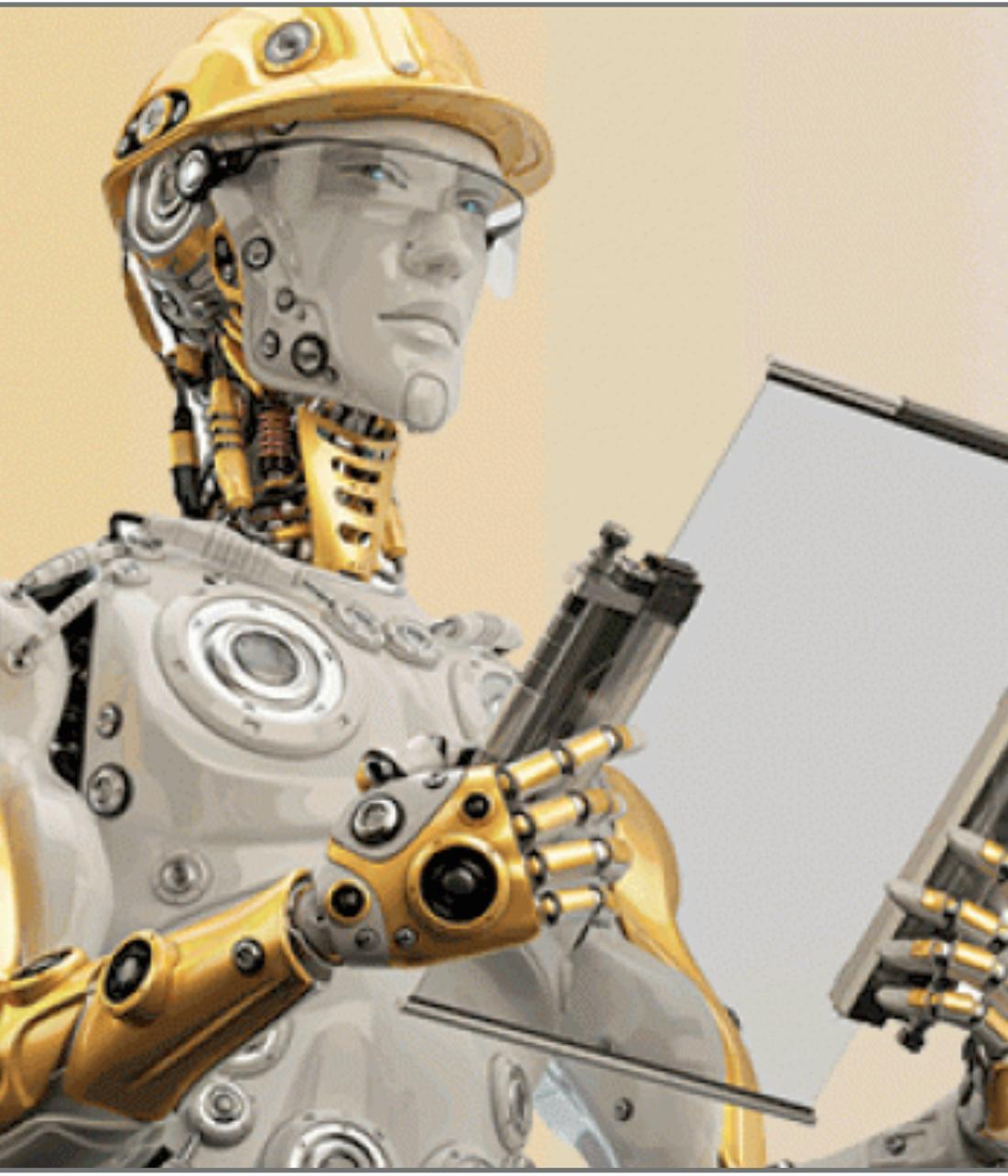
FEATURES AND DEPENDENCIES: MODELS & ANIMATIONS

- Robotic avatar
- Doing task
 - food models: bread, jelly, butter
 - tool models: plate, knife
- Simple kitchen environment
 - possibly reusing models from Udacity early models and starter kits
- Seeing task
 - simple shapes created in Unity
 - simple camera or simple office setting
- Listening task
 - news desk + image/video assets
 - animations for a few tasks to present objects



FEATURES AND DEPENDENCIES: SOFTWARE & PROGRAMMING

- Text to speech with funny robot voice
- Doing
 - Link kinematics between robot hand and human hand for testing
 - Simple memory/copier for task
 - Ordering process for task
- Seeing
 - Capability to create shapes and placement
 - Simple nearest neighbor for placement using shape and pallets placement
- Listening/Speaking
 - Create a few words
 - Create recognition model constrained to a few words
- Compose text as output



FEATURES AND DEPENDENCIES: TEXT TO SPEECH

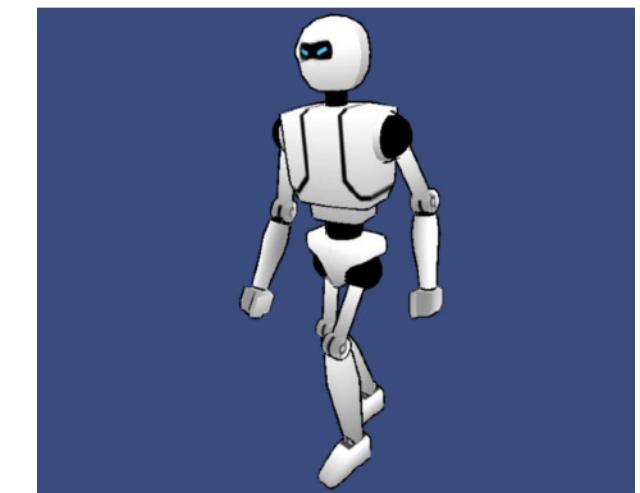
- Text to speech with funny robot voice
- <http://www.acapela-group.com/>
 - would require removal of background
- <https://www.cepstral.com/en/demos>
 - simple demo, apply dizzy droid or other audio effect for robot sound
- Mac "speak" tool plus a visual effect
 - https://www.youtube.com/watch?v=j_FvFAdlbwo
 - <http://www.asktoby.com/#killerringer>
- <https://assetstore.unity.com/packages/tools/audio/speech-auto-detector-86008>
- <https://forum.unity.com/threads/rt-voice-run-time-text-to-speech-solution.340046/>
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FEATURES AND DEPENDENCIES: SPEECH RECOGNITION

- <https://bitbucket.org/Unity-Technologies/speech-to-text>
- <https://stackoverflow.com/questions/39611728/how-to-add-speech-recognition-to-unity-project#39613264>
- <https://assetstore.unity.com/packages/templates/tutorials/vr-watson-speech-sandbox-114015>
- <https://assetstore.unity.com/packages/tools/ai/ibm-watson-sdk-for-unity-108831>
-

FEATURES AND DEPENDENCIES: KINEMATIC ROBOT

- <https://assetstore.unity.com/packages/3d/characters/robots/space-robot-kyle-4696>
 - simple kinematic robot
- <https://assetstore.unity.com/packages/3d/characters/robots/robot-1-65726>
 - larger kinematic robot, may be too scary
- <https://assetstore.unity.com/packages/3d/characters/robots/cyber-soldier-52064>
- <https://assetstore.unity.com/packages/3d/characters/robots/sleek-toon-bot-free-34490>
- <https://assetstore.unity.com/packages/3d/characters/robots/dummy-animation-64322>

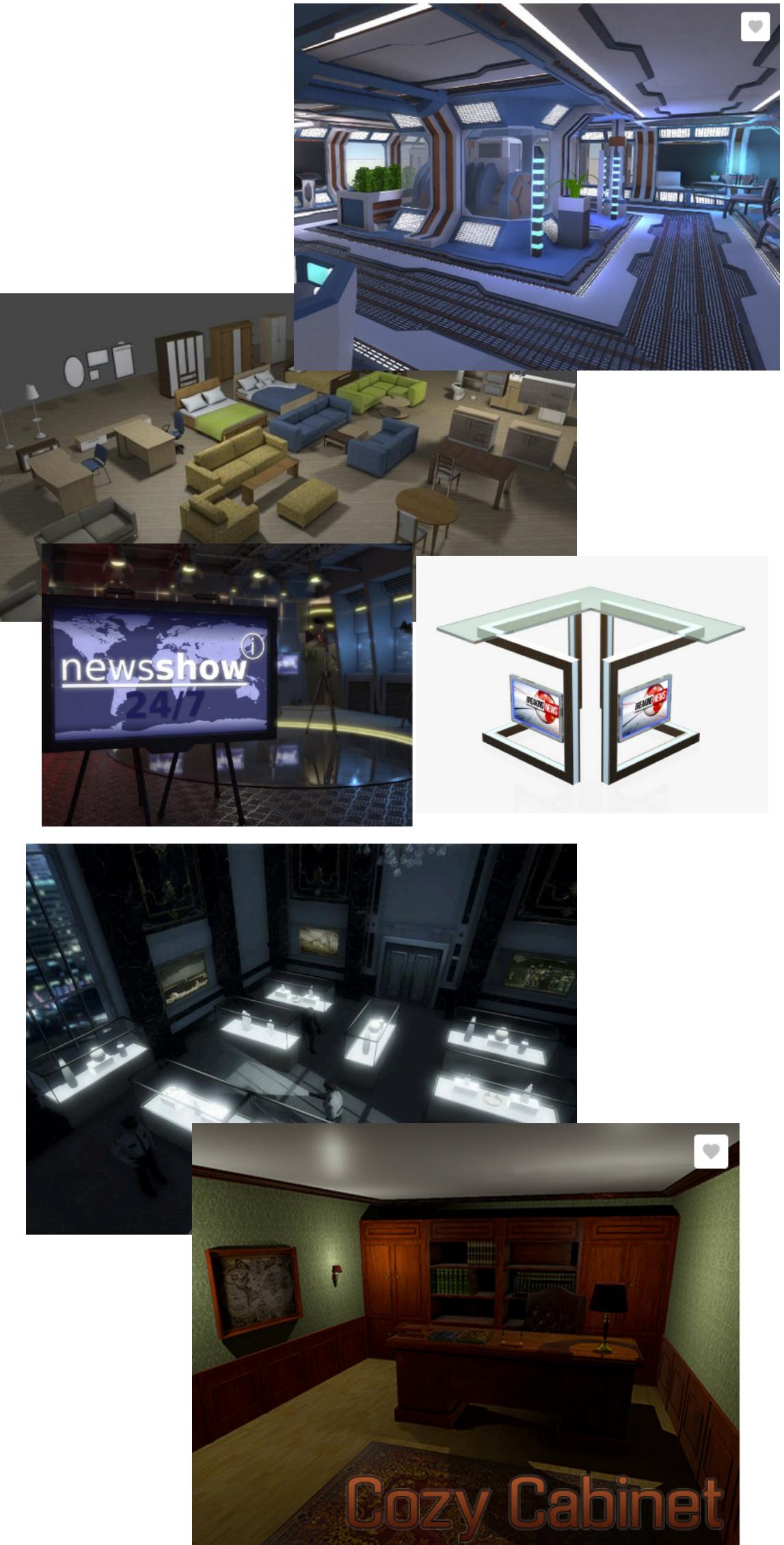


FEATURES AND DEPENDENCIES: MACHINE LEARNING

- <https://github.com/nvnhcmus/kNN> - knn method
- <https://github.com/pavlov/RandomForest> - simple random forest method
- http://accord-framework.net/docs/html/R_Project_Accord_NET.htm
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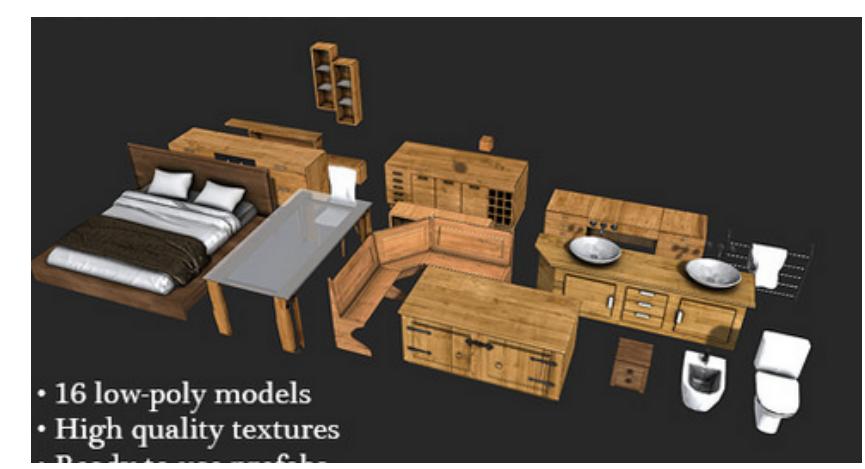
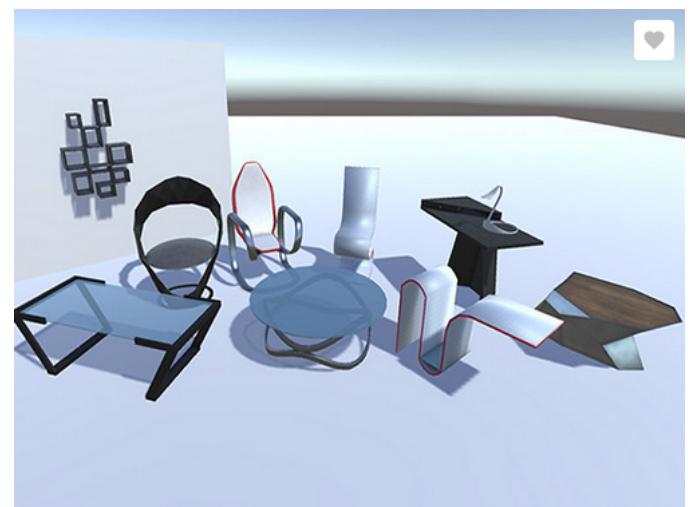
FEATURES AND DEPENDENCIES: ENVIRONMENT MODELS

- <https://assetstore.unity.com/packages/3d/environments/sci-fi/sci-fi-styled-modular-pack-82913>
 - comprehensive space outpost package
- <https://assetstore.unity.com/packages/3d/props/furniture/big-furniture-pack-7717>
 - some beds, couches, etc
- <https://www.turbosquid.com/3d-models/virtual-tv-studio-news-dxf-free/991615>
 - <https://assetstore.unity.com/packages/3d/environments/virtual-news-studio-91126>
 - example of news studio (no model, inspiration)
- <https://assetstore.unity.com/packages/templates/tutorials/the-great-fleece-110186>
 - museum example
- <https://assetstore.unity.com/packages/3d/characters/cozy-cabinet-117482>
 - interior "study" room
- Udacity apartment/kitchen model example
- <https://assetstore.unity.com/packages/audio/music/absolutely-free-music-4883>
 - music!?



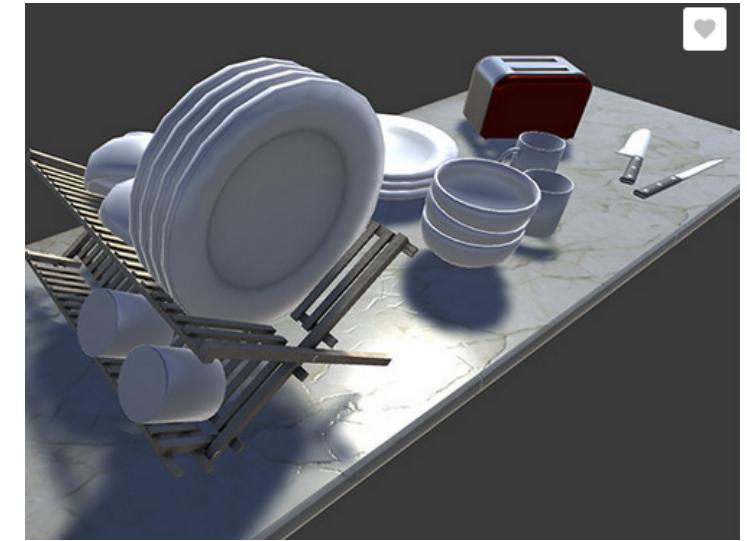
FEATURES AND DEPENDENCIES: OBJECT MODELS

- <https://assetstore.unity.com/packages/3d/props/tools/carpenter-tools-118471>
 - joking tools for cooking
- <https://assetstore.unity.com/packages/3d/props/furniture/modern-furniture-pieces-pack-81417>
 - additional furniture pieces
- <https://assetstore.unity.com/packages/3d/props/furniture/gray-furniture-pack-40580>
 - gray furniture
- <https://assetstore.unity.com/packages/3d/props/furniture/chalet-style-furniture-31966>
 - chalet dark wood furniture
- TV from museum example



FEATURES AND DEPENDENCIES: OBJECT MODELS

- <https://assetstore.unity.com/packages/3d/props/interior/ygs-mugs-96665>
 - coffee mugs
- <https://assetstore.unity.com/packages/3d/props/interior/kitchen-props-free-80208>
 - mugs, plates, toaster
- <https://assetstore.unity.com/packages/3d/environments/fantasy/pirate-tavern-113463>
 - mugs, plates, etc
- <https://assetstore.unity.com/packages/3d/props/interior/props-for-the-classroom-5977>
 - classroom objects



USER PERSONA AND NEEDS

- (child) - ~7 yr old
- Goals: have fun, learn a little
- Experience: very little
- Requirements:
 - Visually interesting
 - Possibly, ability to read prompts



DELIVERABLE SCOPING

- Scene and environment scoping - 7/6, after discovery of the stylized sci-fi module, it appears that environment creation time can be reduced.
- Text-to-Speech and audio generation for robot speech will be deferred until almost the last point in the game; instead text captions will be used.
 - AudioClip clip2 = Resources.Load<AudioClip>("Sounds/cube_up");
- ...
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