

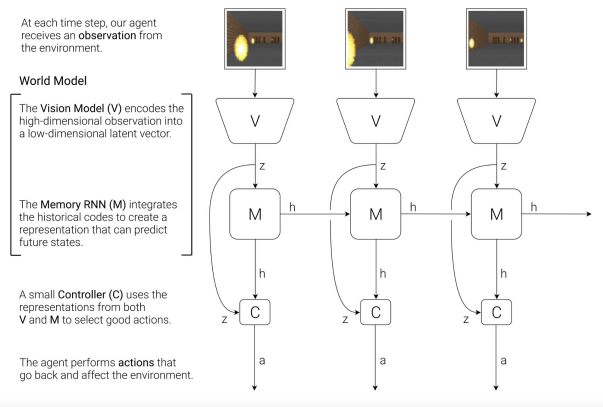
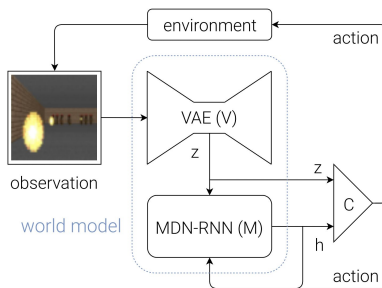
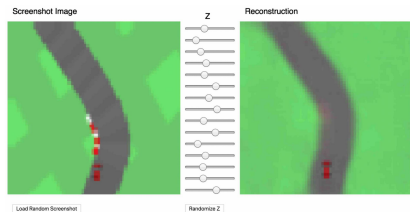
# Build a working prototype on a **WORLD** for gaming

R244 open-source project  
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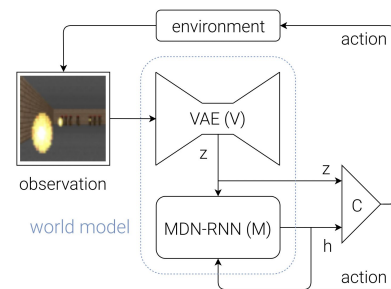
# World model (recap from last week)

- Jürgen Schmidhuber & David Ha “World models” (<https://worldmodels.github.io/>)
- Reinforcement learning using world models trained in an unsupervised manner
- Abstract representation of world
- Minimalistic controller model
- “Learning in a dream”
- Tested on 2 environments
  - Carracing\_v0 & VizDoom
  - State-of-the-art results



# Motivation for project

- “World models” (<https://worldmodels.github.io/>)
- Very good results
- Rather limited experimentation
  - Even in other implementations
- Can it be more generally applied?
- Or were the environments picked very carefully?
- Are the results going to be as good?



METHOD	AVG. SCORE
DQN ( <a href="#">PRIEUR, 2017</a> )	343 ± 18
A3C (CONTINUOUS) ( <a href="#">JANG ET AL., 2017</a> )	591 ± 45
A3C (DISCRETE) ( <a href="#">KHAN &amp; ELIBOL, 2016</a> )	652 ± 10
CEOBILLIONAIRE (GYM LEADERBOARD)	838 ± 11
V MODEL	632 ± 251
V MODEL WITH HIDDEN LAYER	788 ± 141
<b>FULL WORLD MODEL</b>	<b>906 ± 21</b>

Table 1. CarRacing-v0 scores achieved using various methods.

# Project idea and research questions

- Repeat experiment
- Test other (OpenAI Gym) environments
  - Test on real environment as well as “dream learning”
  - Compare results
- Are there other practical uses?
- Is it going to fail in more complex environments?
- Scope somewhat dependent on time and resources...

# What's next?

- Implement through an open-source implementation
  - <https://github.com/ctallec/world-models>
  - <https://github.com/hardmaru/WorldModelsExperiments>
- Repeat experiment on environments used in original experiment
- Pick other environments for testing
- Test, compare results to state-of-the-art solutions
- Write report
- Submit report :)

Or maybe none of it will work out...

# Questions and Suggestions