10: MIXED INITIATIVE PCG

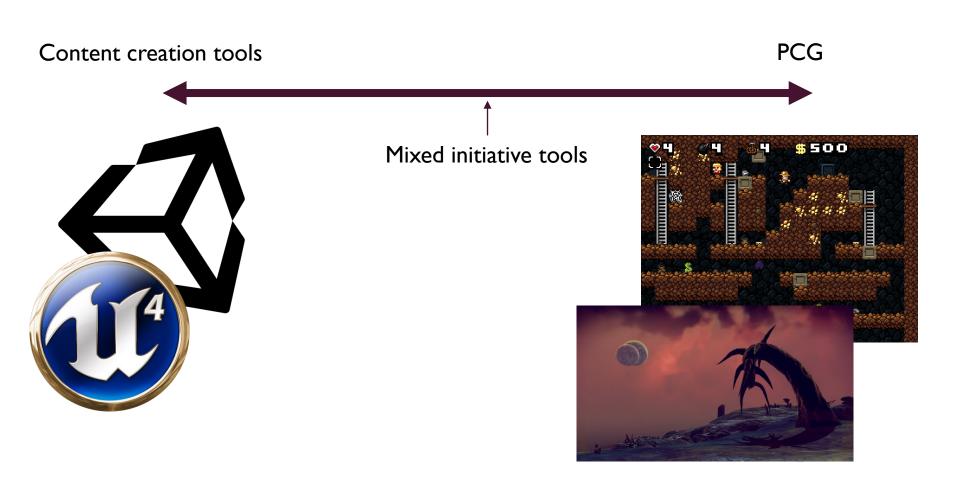
COMP704: MACHINE LEARNING



MIXED INITIATIVE

- Intersection of AI and HCI
- Systems where both the human user and an Al agent can take initiative i.e. decide what to do next
- Moving away from software as a tool and towards software as an assistant

MIXED INITIATIVE FOR PCG



TANAGRA [SMITH, WHITEHEAD & MATEAS 2010]

- Mixed initiative tool for 2D platformer level design
- Uses planning and constraint solving to fill in the gaps in usercreated levels
- Allows for direct manipulation of level pacing through "beats"

https://youtu.be/JaMr4_nEiYo

SENTIENT SKETCHBOOK [LIAPIS, YANNAKAKIS & TOGELIUS 2013]

- Mixed initiative tool for 2D top-down level design
- User sketches high-level design
- System provides analysis and makes suggestions (using evolutionary algorithms)

https://youtu.be/Eop I AuFcujE

SENTIENT WORLD [LIAPIS, YANNAKAKIS & TOGELIUS 2013]

- Adaptation of Sentient Sketchbook to terrain generation
- User provides a rough sketch, Al agent suggests refinements
- Based on novelty search
 - Population-based search algorithm that doesn't try to find the optimum, but tries to find as diverse a population as possible

https://youtu.be/hLsnSSYyg-A

PROCEDURAL PERSONAS FOR SENTIENT SKETCHBOOK [LIAPIS, HOLMGÅRD, YANNAKAKIS, TOGELIUS 2015]

- Procedural personas: Al agents representing archetypal decision making styles
- E.g. monster killer, treasure hunter, speed runner, ...
- Used in Sentient Sketchbook as critics: to evaluate content and make suggestions

https://youtu.be/DZxKj7w-osE

ROPOSSUM [SHAKER, SHAKER & TOGELIUS 2013]

- Mixed initiative tool for puzzle game level design
- Al agent for testing that levels are solvable
- Evolutionary algorithm for generating solvable levels

https://youtu.be/FM3v0tbdKrs

USEFULNESS OF MIXED INITIATIVE

- Can make content creation easier and/or faster
- Can provide ideas to spark creativity
- Can provide tools to assess quality, playability etc
- Gives more control than pure PCG