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The Imitation Game in Games

Distinguishing NPC from Human Player

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Outline

- Background: about DDS
- Conversation-based vs. game-based Turing test
- Loebner Prize vs. BotPrize
- Turing test in board games (chess)
- Turing test in video games (UT2004)
- Player modelling and mimic player types
- The goal of game AI
- When the goals merge, a reversed Turing test in *SpyParty*

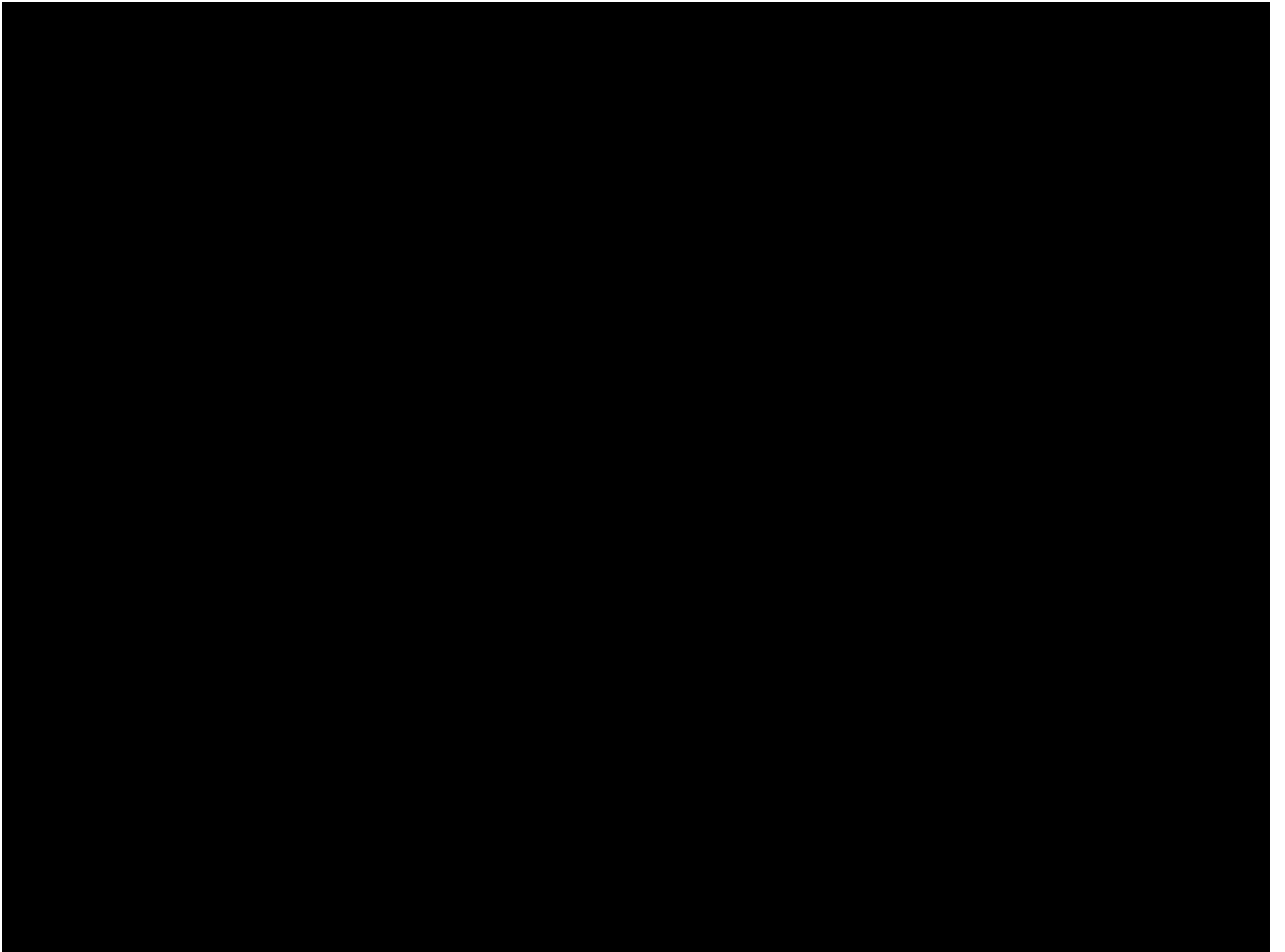
What do we do?

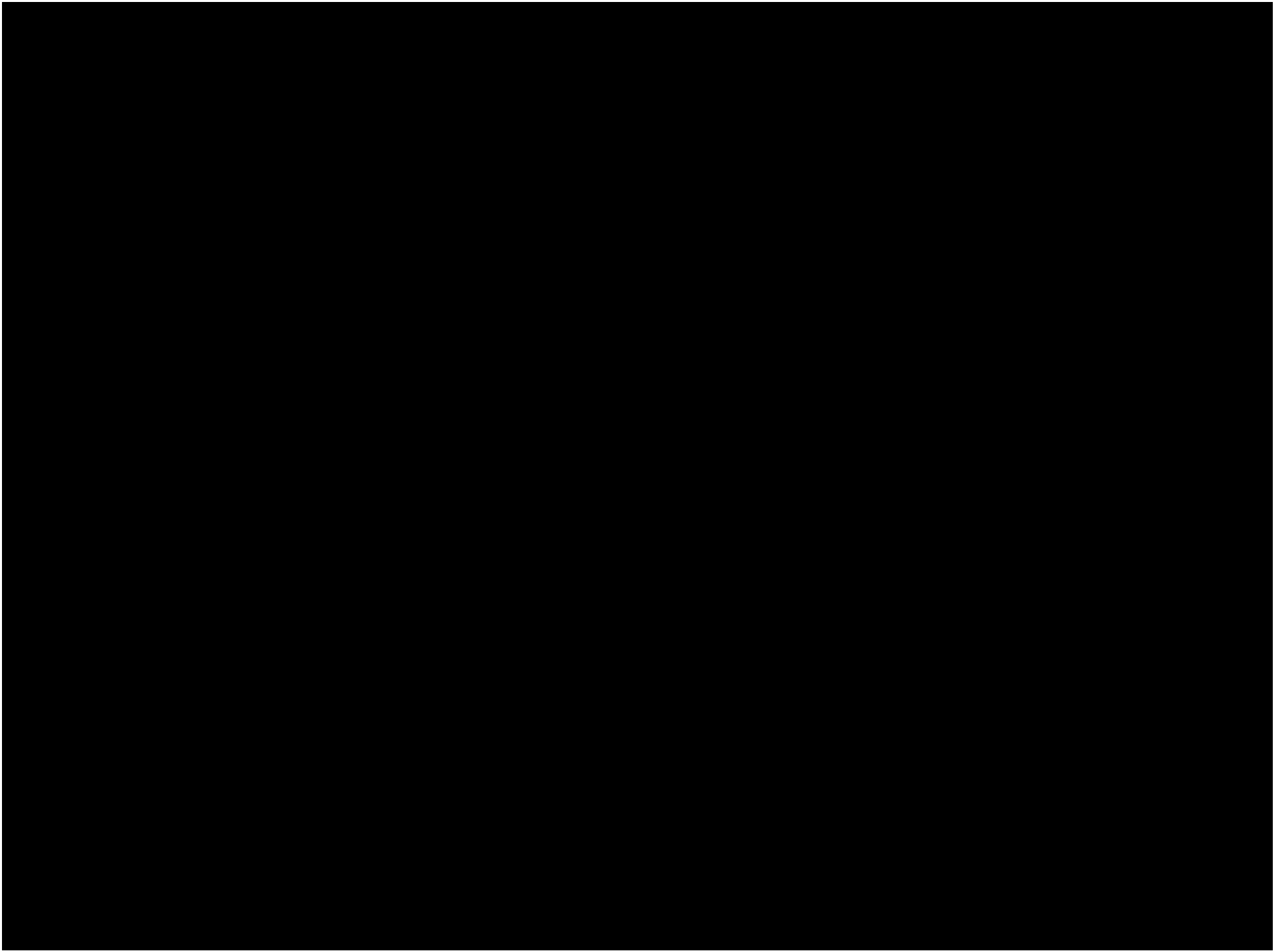
Ultra High Resolution Laser Scanning
3D Digital Modeling
Computer Animation
Full Body Motion Capture
Ambisonic Sound
Software/App Development
HCI: haptics, gesture recognition
Virtual Reality and virtual environments
SGs for Healthcare / education / heritage



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Conversation-based vs. Game-based Turing Test

Conversation-based Turing Test

- Imitate human communication (ie. response to interrogation)
- Areas involved
 - NLP
 - Knowledge representation
 - Information retrieval
 - Reasoning
- Conversations are virtually unlimited (unless topics are restricted)
- Engaging with one human interrogator (1 to 1)
- Single-tasking
- Computer tactics:
 - Artificial stupidity, e.g. deliberately introduce common typos
 - Add personality

Game-based Turing test

- Imitate human behaviours in complex gameplay, e.g. weapon choice, actions, motion (in 3D environment) and manipulation of virtual objects (e.g. weapons). More closely related to robotics than conversation-based Turing test
- Areas involved
 - Player modelling
 - Decision making
 - Path finding, motion planning (in 3D space)
 - Reasoning and planning
 - Voice synthesizing
 - NLP
 - Perception (inc. object recognition)
 - Social intelligence
 - Conversational behaviour

explains why game-based Turing test is currently easier to pass than conversation-based test

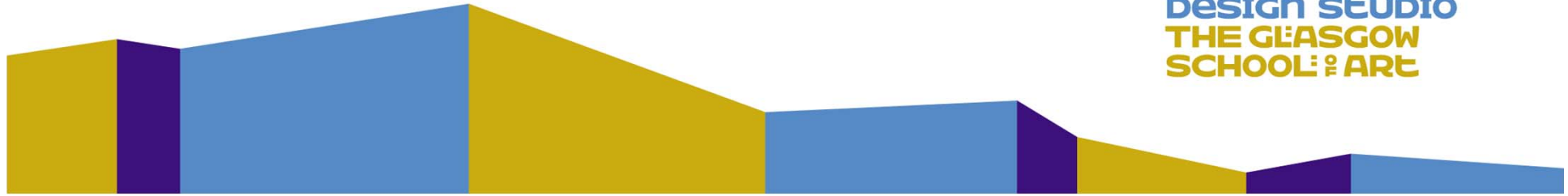
Game-based Turing Test

- Less challenging: **Limited by the gaming platform, e.g. actions available, will be interesting to carry out Turing test in MMORPG genre**
 - More challenging: engaging with multiple opponents/teammates (1 to many)
 - Multitasking: often in chaotic combat
 - Computer tactics
 - Artificial stupidity, e.g. emulating human irrational behaviours
- “People tend to tenaciously pursue specific opponents without regard for optimality. When humans have a grudge, they’ll chase after an enemy even when it’s not in their interests. We can mimic that behaviour.”*
- Add personality (player modelling)

BotPrize

- Participants create NPCs for UT 2004 (a FPS game) that can fool opponents (judges) into thinking it is a human player
- In BotPrize 2012 two teams have passed the human-like play barrier
- Computer gets a rating higher than the ratings of the real humans?





BotPrize 2012 results

NPCs

bot name	humanness %
MirrorBot	52.2 %
UT^2	51.9 %
ICE-CIG2012	36.0 %
NeuroBot	26.1 %
GladiatorBot	21.7 %
AmisBot	16.0 %
average	34.2 %
Epic bots	37.8%

Human Players

player name	humanness %
Samaneh Rastegari	53.3 %
Craig Speelman	52.2 %
John Weise	30.8 %
Chris Holme	26.3 %
average	41.4 %

Only judgements made by human judges are counted.

However, not all games involve humanoid character

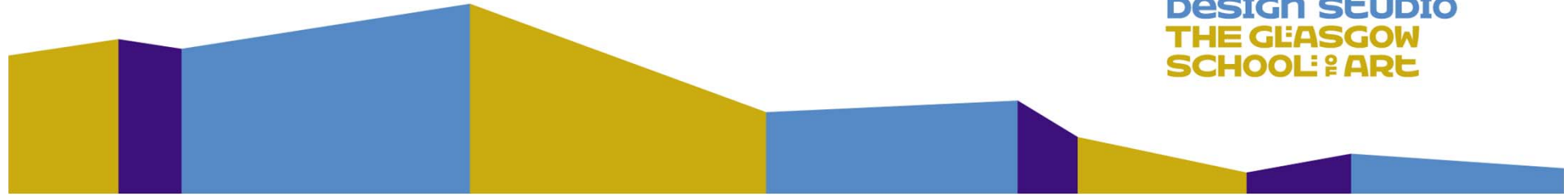
- How about game-based Turing test in board game or casual games platform?
- The limitation by the platform of 3D video games is removed
- Computer players are virtually unbeatable by humans in chess, poker, and many other games
 - Deep Blue vs. Garry Kasparov (1997)
 - Watson vs. Ken Jennings & Brad Rutter (2012)
- Many fans and chess lovers plays online matches, but who are we playing with?
- Has computer passed the Turing Test in these games?

No. The purpose of game AI is

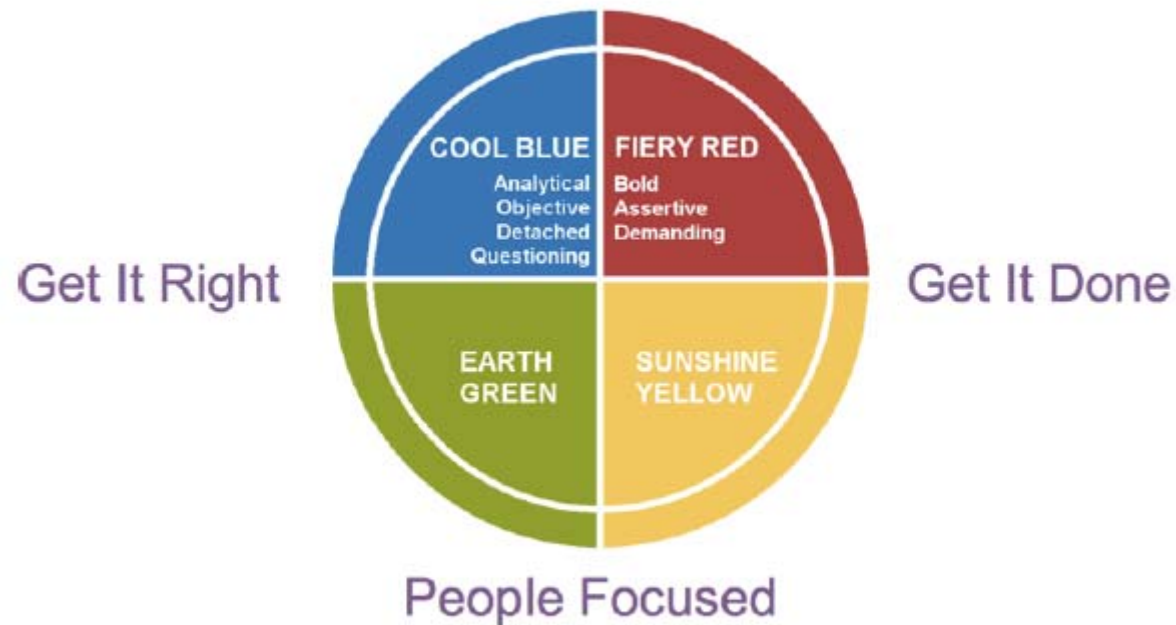
- Not to create *unbeatable* games
- but to create *indistinguishable* computer players (NPCs / bots)

The Turing Test and Chess

- Chess can revealing much more about human beings and their behavior, through the symbolism of the game and the way we play
- It cannot reveal a lot about a bot if not the accuracy of the programmers & software
- So the Turing Test challenge in chess platform is more on player modelling and mimic a specific type of players' behaviour



Task Focused



DISC Personality Model

Gwaredd Mountain, Technical Director for Climax

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Bartle player models

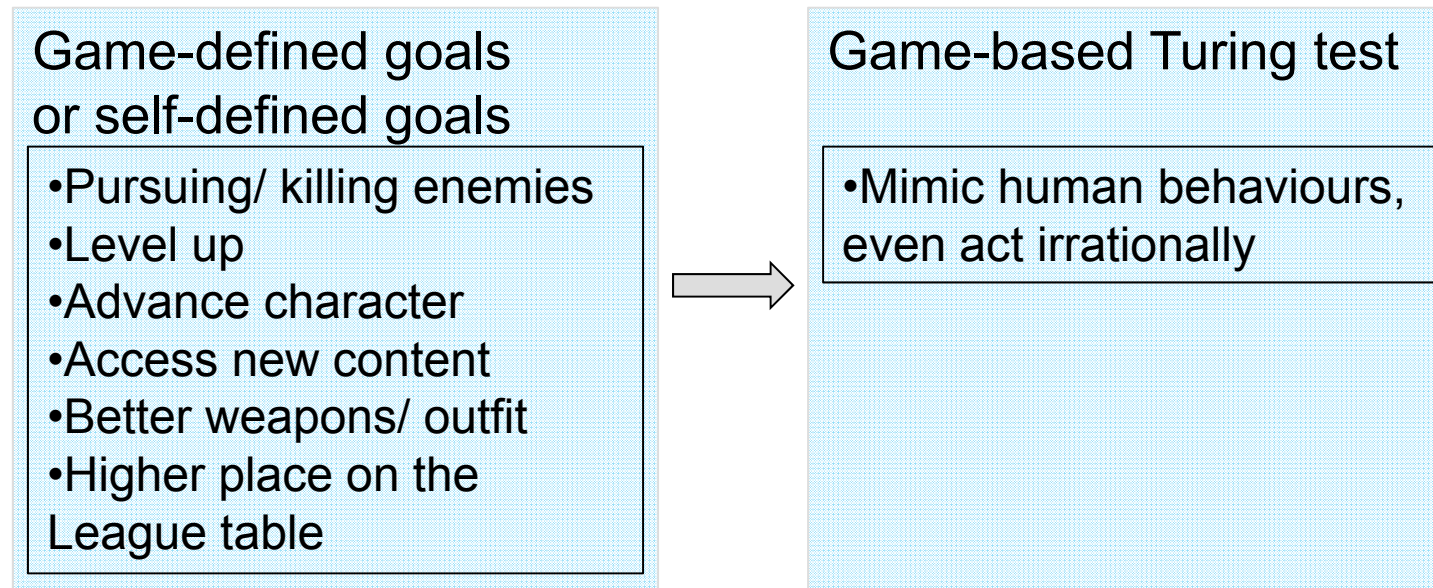
- Richard Bartle gives a well used profiling system based on a set of game-scenario questions
- Classifies players into four types
 - Explorer, Achiever, Socialiser, Killer
- <http://www.gamerdna.com/quizzes/bartle-test-of-gamer-psychology>

Mimic the specific player type of human judge (player)

- *Mimic the body language of those you are conversing with, so that you can get closer to them in a non-verbal fashion. If someone is gesturing a lot, you can join in, while if a person is more reserved, you shouldn't gesture too wildly.*
- Build up a model of players through player observation
 - Monitor what human players are doing in the game
 - See what they are doing
 - *Understand why they're doing it*
- Mimic their player type. e.g. be a socialiser if the human player is a socialiser.

Game-based Turing test

- Shifting of the goal



Reverse Turing Test

- A formal reverse Turing test follows the same format as a Turing test. Human subjects attempt to imitate the conversational style of a computer program such as ELIZA

SpyParty – a reverse Turing Test in video game



- NPCs imitating human behaviors
- Human imitating NPCs
- sniper vs. spy
 - spy - avoid detection from the sniper, who has a full view of the party
 - sniper - distinguish the spy and kill him

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Further information

www.gsa.ac.uk/dds



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