Performatology:
An Arts Approach to Designing Performative Embodied Agents (PEAs) for Procedural Character Animation

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Where is the Charlie Chaplin, Jim Henson, Bruce Lee, or Michael Jackson of autonomous agents?
Motivation

Where is the *presence* of professional performers in games and interactive narrative?
Motivation

Would we still be moved by Kermit if the essence of Henson wasn’t reaching us through a foam puppet?
Motivation

Would Casablanca mean much without the distinct performances of Bogart and Bergman?
Motivation

And what about Fred and Ginger???

Does anybody remember (or even care about) story details?
Motivation

Early film focused on dramatic acts, allowing Vaudeville performers to translate their craft to Cinema.
Actor presence is a gestural signature inherent in the physical technique of performance artists,
and is what makes a fictive persona believable, expressive, and appealing (in short, good).

So what about agents?
Motivation

Let actors play through agents as procedural acting tools, and get the performer in the game.
For a fictive character in a cinematic game, wouldn’t you cast Tom Hanks if you could?

This is Performatology.
Definitions

- **Performatology**
  - Engineer live performer modeling
  - Performance and animation theory
  - Machine learning on mocap data

- **Performative Embodied Agents (PEAs)**
  - New abstract acting medium for performers
  - Project presence through an agent

- **Procedural Acting**
  - Simulate mimicry plus improvisation
  - Master-apprentice training process
Related Research

- **Interactive Narrative-Drama**
  - Laurel (1991) and Murray (1998), Drama based on Aristotle and Commedia del Arte
  - Mateas and Stern (2004), *Façade* Dramatic Beats
  - Seif El-Nasr (2004), *Mirage* Cinematic Integration

- **Procedural Character Animation**
  - Perlin and Goldberg (1996), Improv and Actor Machine

- **Data Driven Performer Modeling**
  - Kipp and Neff (2008), Professional Speaker Style

- **Machine Learning of Gesture Style**
  - Brand and Hertzmann (2000), Style Machines
  - Wang et al (2007), GPLVM Style-Content Separation
  - Chiu and Marsella (2011), HFCRBM Style Controller
Evolving Whirled PEAs

We are training a neuro-evolutionary algorithm on mocap data to simulate mimicry.
PEAs Design

IMPRSONA  PEAs Mimic Module
Engineering Mimicry = Domain Knowledge + Unsupervised Machine Learning

Training of Apprentice Performer

- Performer Modeling
- HyperNEAT Neuro-Evolution
- Recognition Prediction Synthesis
- Procedural Mimicry

Master Performer

Live Source Performer

MoCap
ProcAnim

Procedural mimicry = Performer modeling, recognition, prediction, and synthesis.
Background

My DANM MFA performance study inspired Performatology.
Audience feedback suggested CS problems (Uncanny Valley, Turing Test...) can be approached as agent acting problems.
Realize Craig’s vision of the *Uber-Marionette* as the perfect acting medium?
Applications

Next generation of theme park and cinematic games characters?
Applications

Gestural Imitation Game, anyone?
The Performatologist is in...

Please gesture for discussion, Thanks!

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