

# Physical Character Animation

## using Machine Learning

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## Proposed Abstract:

In modern video games there is an increasing need for high-fidelity physical and physics based animations for characters. These animations can be extremely time consuming and expensive to make using traditional methods such as hand-keying or motion capture, and require many professional animators. Also, most existing procedural animation tools only work on human skeletons. This project creates physical animations for video game characters using genetic algorithms. Characters have realistic 3D physicality and learn coordinated muscle-based motion to satisfy a goal. The simulation runs as an application made with Unity, C#, and NVIDIA PhysX. Data about the genome and a preview of the simulation is uploaded to a database and can be viewed online to see trends and comparisons between different generations, characters, and takes. The website and server use JavaScript, MySQL, PHP. There will be a minimum of 3 unique characters (such as dog, raptor, inchworm). The database will be able to hold the best genome and history of at least 500 generations.

## Expected Deliverables:

Design document - October;

Prototype with some genetic algorithm and website running - December;

Core functionality done - February;

Completed application and website - May;