



Potential Student Research Projects

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Do deep learning:

Use one of the high-level [deep learning](#) tool-kits (like [keras](#)) to solve learning problems in robotics or computer vision.

Make robots learn about objects:

Working with a physics simulation (like [pymunk](#) or [bullet](#)) and machine learning techniques, get robots to learn to understand and move objects.

Sensory augmentation:

Work with [sensory substitution](#) and [sensory augmentation](#) systems that might even help blind people “see” using sound.

Help students learn Python:

Work on techniques for automating, supporting and [gamifying](#) learning to program.

Make robots learn about their bodies:

Use machine learning, [computer vision](#) and simulation techniques to get a robot learning about its own body and abilities.

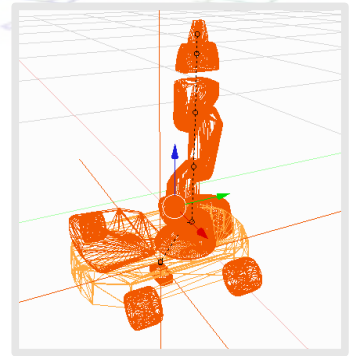
Physics-based object tracking:

Work on the computer vision problem of 3D [object tracking](#) for robot perception but use a knowledge of physics to do it better.



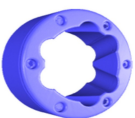
Machine learning for visual depth perception:

Use machine learning techniques to get computers to see [depth from images](#).



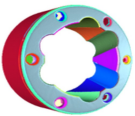
Machine Learning for simulation:

Use modern machine learning to efficiently [predict object motion](#) for simulation in e.g. games, robotics.



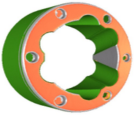
Logic programming for computer vision:

Generalise computer vision (or point cloud) algorithms using control flow from [logic-programming](#).



Probabilistic methods for object tracking:

Work on [particle filters](#) and related methods



Object recognition:

Work on [object recognition](#) and segmentation with 3D point cloud data.



Discrete Event Simulation Tools

Move GPSS-style discrete event simulation into Python.

Learning to play difficult physics-based games:

Write artificial intelligence to play physics-based games like [Armadillo Run](#), [agar.io](#), [Phun](#), [Powder Toy](#) & [Liquid War](#).

