



Potential Student Research Projects

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Deep learning problems:

Use one of the [deep learning](#) tool-kits (like [keras](#) or [tensorflow](#)) to solve important deep learning problems like depth from a single image or robot action.



Machine learning for visual depth perception:

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

Robot object manipulation and learning:

Get a robot to move objects around using point cloud and depth image information.

Robot navigation, obstacle avoidance with single cameras and learning:

Use cutting edge learning AI to use single cameras, as humans might, to make robots navigate successfully.

Make robots learn about objects:

Working with a physics simulation (like [pymunk](#), [bullet](#) or [MuJoCo](#)) 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.

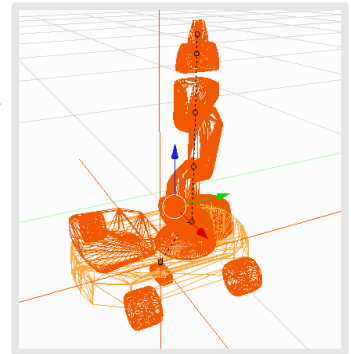


Make robots learn about their bodies:

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

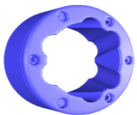
Physics-based object tracking:

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



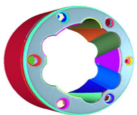
Machine Learning for simulation:

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



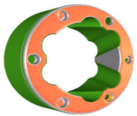
Logic programming for computer vision:

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.

