**Title:** Optimal Gaze Control Through Reinforcement Learning

**Abstract:**

Biological systems have been shown to achieve near optimal decision making when exposed to noisy sensory information. We investigate how such behaviour can be trained through positive and negative feedback for the field of robotics.

We consider an agent trying to maximise reward when presented with objects of different values. The agent can execute grasping and gaze fixations. The visual information received is, however, perturbed by noise, meaning that true object position is uncertain. When grasping close to the true object location the agent is rewarded, otherwise it is punished.

The agent is trained through reinforcement learning using radial basis function networks. The algorithm is able to learn near optimal decisions for both grasping and gaze fixation. Outside special cases, we find that optimal gaze fixation does not have a large impact on total cumulative reward. Optimal grasping decisions are able to compensate for cases when the agent’s gaze fixations are random.