1001-92-370 **Joel W Burdick*** (`jwb@robotics.caltech.edu`), Mail Code 104-44, Pasadena, CA 91104.
Algorithms for Neural Prosthetics. Preliminary report.

A "neural prosthetic" is a brain-machine interface that enables a human, via the use of surgically implanted electrode arrays and associated computer decoding algorithms, to control external electromechanical devices by pure thought alone. In this manner, some useful functions that have been lost through disease or accident can be partially restored. Patients who might benefit from such a prosthesis would include those with spinal cord lesions, peripheral nerve disease, stroke to motor cortex, and ALS. Robots are prime candidates for the output device of prosthetic systems.

A large group at Caltech is working to develop a neural prosthetic that can aid the handicapped. This talk will first summarize our overall efforts to develop neural prostheses based on the brain's Parietal Reach Region. We then describe our experimental set-up for testing this concept on primate models, and present preliminary experimental results that demonstrate the possibility of using a cognitive neural prosthetic to control external devices by pure though alone. The second half of the talk will focus on the algorithmic problems associated with the neural prosthetic systems, as well as our preliminary attempts to solve these problems. (Received August 31, 2004)