1100-49-359 **Methma M Rajamuni*** (methma.rajamuni@ttu.edu), 2717 3rd street, Apt 504, Lubbock, TX 79415. *Optimal control problems in Binocular vision.*

Human eye movement can be looked at, as a rotational dynamics on the space SO(3) with constraints on axis of rotation. A typical binocular eye movement can be decomposed into two systems that go by the name 'version' and 'vergence'. Herring's law proposes that the version system of the eye movement is identical in both eyes. A classic eye-pair movement would be regarded as a concatenation of version followed by vergence. Version eye movement is used to take the general direction of the target, and vergence eye movement rotate eyes in opposite direction to focus on target. In this talk, we will discuss such eye movements using unit quaternion, with constraints. Assuming that the eyes are perfect spheres with their mass distributed uniformly and rotating about their own centers, eye movement models are constructed using classical mechanics. Optimal eye movement trajectories are simulated for target in near field, for which both version and vergence eye movements are required, where the goal is to minimize a quadratic cost function on the energy of the applied control torques. (Received February 10, 2014)