

灵峰论坛

Riemannian Geometric Problems in Eye and Head Rotation

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Bijoy received his Ph.D. degree in Engineering Sciences from the Decision and Control Group of the Division of Applied Sciences, Harvard University, Cambridge, MA, in 1983. Currently he is the Dick and Martha Brooks Regents Professor of Mathematics and Statistics at Texas Tech University, Lubbock, TX, USA. He received the D. P. Eckmann award in 1988 from the American Automatic Control Council, the Chinese Academy of Sciences Invitation Fellowship in 2016 and 2018, the Distinguished Visiting Professorship to visit IIT Kharagpur, India in 2016. He became a Fellow of the IEEE in 2000 and a Fellow of the International Federation on Automatic Control in 2014.

Abstract

In this talk, our goal is to study optimal control problems on human head and binocular eye rotation as a simple mechanical control system, extending our earlier studies on monocular control system. We assume that during the eye and head movements, the rotating body separately obeys a suitable form of Donders' law. A Riemannian metric has been introduced and the corresponding Euler Lagrange dynamics is written out. We have displayed the geodesic curves for binocular eye movements satisfying the Fick Gimbal. Optimal trajectory plots are subject of current research.