Projective Geometry and Feedback Stabilization

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Abstract:

The goal of this paper is to provide a geometric study of the well-posedness and stability concepts associated to the feedback control loops. The usefulness of Kleinian-view of geometry is emphasized and tools from matrix projective geometry are applied. It will be shown that Möbius transforms play a central role to arrive to the group structures that characterize the well posed and stable feedback connections of dynamic systems. The well-known Youla parametrization is obtained as a special case of this group of transforms.

Short CV

Jozsef Bokor received the Dr. Eng. And Pd.D. degrees from the EE Department of Budapest University of Technology and Economics. He is Professor and former Head of the Automation Department, Faculty of Transportation and Vehicle Engineering, Budapest University of Technology and Economics. He is also Research Director of the Computer and Automation Research Institute, Hungarian Academy of Sciences. He spent the year 1976/1977 at the *Imperial College of Science and Technology, Computing and Control Department*, London, England, the 1990/1991 year *at MIT Laboratory for Information and Decision Systems* as visiting Fulbright professor. His research included identification of space structures and design of multivariable robust control. He continued working with MIT under a Joint US-Hungarian Research Program in 1992-1995. He has a strong collaboration with the Laboratory for Measurement and Control, *Technical University Delft*, The Netherlands. and with the *Department of Aerospace and Mechanics, University of Minnesota, US, MN.*

His Department and Laboratory participate in several EC projects on automotive and spacecraft control, and in UAV project supported by ONR US. He is member of IEEE CSS, IFAC TC on System ID and Safeprocess, used to serve as IFAC Technical Board Vice Chair and Associate Editor of IFAC Journal Automatica.

He authored/coauthored over 500 scientific and technical papers and 8 books. He was elected Corresponding Member and later Member of the Hungarian Academy of Sciences in 1999 and 2002, respectively. He is a Fellow of IEEE and IFAC.