Kurian C Kurian

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Career Overview

- **Bharat Petroleum Corporation Limited** Mumbai,India
  2009 - 2011

  - **Hariyala:** In the capacity of marketing officer managing the production department, I studied the various possibilites to reduce the overloading of motors that run the chain conveyors. This resulted in the redeisgn of a certain section of the conveyor belt and also the timely rewinding of a motor. It also lead to the building of a ramp to ease the movement of cylinders on the work floor.
  - **Bhitoni:** Remote Operated vales are a key component in any petroleum plant, they are particularly important in LPG plants because they let the operator close main pipelines from remote.As an operations officer in Bhitoni I was part of the team that lead installation of ROVs on main pipelines of the plant.

Research Interest

- **Use Of Charactersitic Sets In 2-D Descrete Systems** IIT-Guwahati
  2012-2014

  - **Controllability in the 1-D:**Controllaiblity and observability are well defined for 1-D systems. It is taught in basic courses of electrical engineering everywhere. An essential part of design of any elctrical,mechanical or electromechincal sytem is to ensure that they are controllable and are stable for a known range of operating conditions
  - **Controllablility for 2-D Discrete Systems:**The essential question when acertianing controllability of systems that are goverened by two independent parameters is the question of natural ordering. While future,past,present are obvious in 1-D systems what defines such things for the 2-D system? without such defenitions can we define controllability or observability? what can one say about a system that gives bounded output along one of the independent axes but is unbounded on the other? Such questions were taken up in the paper of Dr Jan C Willems [Wil91] .This paper deals with systems as a set of trajectories,which is departure from the conventional treatment of system as black box. In subsequent times efforts were made to truly implement the idea of behavioral systems and to find universal defition to their controllability and observability. The paper by of Maria E Vlacher[Val00],Zampieri [FRZ93],HK Pillai and D. Pal [PP14] are examples of the on going research in this feild.
    two dimensional systems are an explicit example where behavioral [Wil91]approach works and yeilds meaningful deductions for controllability and observablilty. Study of charachteristic sets is cruciual in this context because they form the part of defining observability and controllability for behaviorals. My thesis gives an interpretation of the conclusions in [PP14] which leads to a surprising result that charachteristic sets can indeed be more compactly defined than previously thought.

Writing and Awards

- **2016 Forbes 30 Under 30:** Enterprise Tech. `http://onforb.es/1OILpBZ`

- **Department of Energy Computational Science Graduate Fellow:** Four year full fellowship. ~20 awarded nationally per year. Won the Communicating Science award (`bit.ly/VbcTZK`).

- **SigOpt Blog:** Posts talking about using SigOpt to optimize everything (`blog.sigopt.com`).

- **Yelp Blog:** Wrote several posts announcing the open sourcing of MOE, the Yelp Dataset Challenge and more. `bit.ly/1x73xdr`, `bit.ly/1oCCZvv`, `bit.ly/1sOsEBS`, `bit.ly/1plX7Hk`

- **Press:** WSJ: `on.wsj.com/VaOvqQ`, Cornell: `bit.ly/1oB2dzm`, DIEXIS: `bit.ly/1oofbl4`

Skills

- **Control Systems:** Designing feedback systems for linear control systems. Writing code to represent nonlinear systems in MATLAB.Finding solutions to nonlinear equations using MATLAB.

- **Tech Stack:** Python, C++,javascript,Go,php

- **Frameworks:** Django,API design in Go

Selected Open Source Projects

- **SigOpt Examples** (`github.com/sigopt/sigopt-examples`)   Python
  Examples of using SigOpt to tune ML algorithms.   *2014 - current*
  - Examples of using SigOpt to tune everything from sklearn to beating Vegas and beyond.

- **MOE: Metric Optimization Engine** (`github.com/Yelp/MOE`)   Python, C++, CUDA
  A global, black box optimization engine for real world metric optimization   *2010 - 2015*
  - Implemented throughout Yelp, optimizing ad metrics. 2nd most popular open source project.
  - Talk: `bit.ly/1plYZA2`, Slides: `slidesha.re/1zOrOJy`, Blog: `bit.ly/1x73xdr`
  - Presented to executives, universities, conferences and companies around the country.

- **ALE: Assembly Likelihood Estimator** (`github.com/sc932/ALE`)   C, Python
  Probabilistic evaluation of genome assemblies   *2010 - 2013*
  - Uses statistical function to score and rank genome assemblies, published in Bioinformatics

References

[FRZ93] E. Fornasini, P. Rocha, and S. Zampieri. State space realization of 2-d finite-dimensional behaviours. *SIAM Journal on Control and Optimization*, 31(6):1502–1517, 1993.

[PP14] D. Pal and H. K. Pillai. Novel representation formulae for discrete 2d autonomous systems. In *53rd IEEE Conference on Decision and Control*, pages 1307–1312, Dec 2014.

[Val00] M. E. Valcher. Characteristic cones and stability properties of two-dimensional autonomous behaviors. *IEEE Transactions on Circuits and Systems I: Fundamental Theory and Applications*, 47(3):290–302, Mar 2000.

[Wil91] J. C. Willems. Paradigms and puzzles in the theory of dynamical systems. *IEEE Transactions on Automatic Control*, 36(3):259–294, Mar 1991.