

Wikipedia SIAC pages: Status and Proposal for going forward

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SIAC on wikipedia

- Wikipedia is the go-to source for many
- Question: How well is SIAC represented on wikipedia
- Question: What can we do to improve knowledge based on SIAC on wikipedia
- Mission: Find current status and present a report

System ID on WIKI

- http://en.wikipedia.org/wiki/System_identification
- Very brief
- No mention of several keywords, such as time domain, ARMA, frequency domain
- Estimation theory has a brief page, and linked from system identification
- Kalman Filter and Extended Kalman Filter have decent descriptions with equations

Adaptive Control

- http://en.wikipedia.org/wiki/Adaptive_control
- Page lists a number of adaptive control methods
- Information is terribly outdated (e.g. MRAC lists very early information)
- No links for most of the individual subtopics
- Gain Scheduling and Iterative control have half a page
- Intelligent control lists very high level description and links out to neural networks etc.
- Nonlinear control lists Popov criterion
- Certainty equivalence unclearly defined under Stochastic control

Status

- As suspected: Poor representation of SIAC on wikipedia
- Need more details, recent works, citations, and links to useful resources
 - New directions in adaptive control needs to be updated such as works towards certification and works employing new learning methodologies
- Need to make other communities aware of SIAC literature: e.g. Machine Learning, AI, CS
- AI and Machine Learning pages are well populated on the the Wiki, “others” are ahead of us

Suggested Course of Action

- It is imperative to SIAC that we convey our importance in the bigger picture
 - Helps in clarifying the importance of the research
 - Helps in improving and judging the impact
- Two pronged approach:
 - Community-sourcing: Everyone take the lead on fixing relevant pages
 - Assign a committee to prioritize keyword list and start fixing pages one by one
- Scope of work too large for single person
- How to motivate the community?
- Work towards building a culture of Wikipedia modification through rewards:
 - E.g. Would this work serve towards NSF broader impacts?
 - Work with DoD PMs to incorporate this as an ancillary deliverable?

Example: Three tiered priority classification

■ Field:

- System Identification

■ Principles:

- Parameter Estimation
- Model types
- Time domain, Freq Domain

■ Methods

- Kalman filters
- Inference based
- Maximul likelihood...

■ Field:

- Adaptive Control
- Direct Adaptive Control
- Indirect Adaptive Control

■ Principles:

- Certainty Equivalence
- Learning based control..

■ Methods:

- MRAC, ILC, Adaptive MPC etc.