LECTURES AND EVENTS AT THE WORKSHOP

A Cartoon Summary

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It has been a tradition at a number of topical control conferences to present special awards at the end of the conference. I was prepared to do the same at this workshop, when I had a vision that clearly summarized (for me, at least) the lectures and events that occurred during our 10 days together in Antalya. This vision is presented in the cartoon "Moon Over Antalya Bay", which depicts the moonlight cruise that we enjoyed early in the workshop. In the following paragraphs I present the events illustrated in the cartoon in roughly the same order as they occurred during the workshop. Footnotes are provided for the benefit of those that did not attend the conference.

Controlling a large sailboat is a complex problem and each lecturer had a different opinion about the best method to be used. In the lower left corner we notice that Yaman Arkun is attempting to use a number of model boats (sailboat, canoe, speedboat and jet-ski) to represent the behavior of the large sailboat under different operating conditions.[1]

During the course of the cruise a number of people got sick because of the rocking of the boat due to wave action. We see below deck that Ahmet Palazoglu is lying on a table trying to recover from a bout with sea-sickness. Notice that Denis Dochain has come to his aid. Dr. Dochain is concerned that the illness may be due to a bacteria, and claims that Ahmet can learn all about how to control biochemical systems by "reading his book".[2] Dr. Daoutidis is recommending that Ahmet will feel better if he simply "neglects the fast modes".[3]

Going above deck we find a number of events taking place. First, we see that Andre Damslora has fallen overboard, but was saved by his tie.[4] Next, we note that Frank Allgower and Simone de Olivera are struggling to determine who can guarantee a stable control algorithm for the sailboat.[5] To the right we see that Alex Zheng is consulting a crystal ball to determine the optimal set of future control moves.[6] Wolfgang Marquardt is using a sextant to infer the position and velocity of the sailboat, and to use these for the control computation.[7] When trying to determine a model for control system design, it is important to have a proper sequence of input signals. We see that Ron Pearson is using a belly-dancer to assist him in applying forces to the boat to determine a process model.[8]

This workshop had some interested collaborations that one would not have normally expected. In the bottom center we notice that Costas Kravaris and Cole Brosilow are feverishly rowing a lifeboat in different directions. Also, we see that Ridvan Berber has fallen out of the lifeboat and is struggling to keep his cellular phone out of the water.[9]

Masoud Soroush is in a lifeboat drifting towards a rock (a hard constraint); he is

busy calculating the best control moves to avoid the rock.[10] To the lower right we see that George Stephanopolous is riding the crest of a "wave-net" to land on the sailboat and take control.[11]

On shore, we notice that Jens Balchen is preaching about his END algorithm and manipulating a number of knobs to design a nonlinear controller for the sailboat. A number of textbooks on differential geometry have fallen off the wall (recall that Lie was a Norwegian mathematician).[12] To the right we see that Masoud Nikravesh is trying to recruit a number of sailboat owners to join a consortium to study better sailboat control techniques.[13]

In the center of the shoreline we notice that Ferhan Kayihan, with ax in hand, is dreaming about how the wood from the sailboat could be used to provide chips for a Kaymr digester. Finally, we see an oven with a number of "half-baked ideas".[14] After my presentation of the cartoon summary, Costas Kravaris noted that since I did not appear I must be at the piano bar.[15]

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[1] On the first day of the conference Yaman presented a lecture on a multiple-model-based approach for process control

[2] Those attending the workshop will recall that Denis shamelessly held-up his book on biochemical reactor modeling and control a number of times (well, at least once) during his lecture.

[3] Prodromos presented a singular perturbation approach where a system is decomposed into slow and fast modes.

[4] During the course of his presentation Andre changed from "management mode" to "engineer mode" by taking off his tie.

[5] Recall that Frank and Simone had a heated discussion of the stability of model predictive control algorithms.

[6] During Alex's presentation there was some confusion about the C(x) function which provides an analytical solution for all control moves after the first one.

[7] Wolfgang's lecture was on dynamic data reconciliation.

[8] Ron showed us a set of semi-stochastic moves on "Turkish night" when a belly-dancer asked him to dance.

[9] Although Costas and Cole were co-authors on a paper, they did not seem to agree on much of the content of the paper. Ridvan was constantly on the move throughout the workshop, handling changes in schedules, etc. - his cell-phone never left his side.

[10] Masoud gave a lecture on techniques to handle input saturation in multivariable systems.

[11] To state the obvious, George presented a lecture on wave-nets.

[12] The END algorithm that Jens presented appeared to require a tad bit more engineering insight than a number of us had. As always, Jens provided a number of provoking statements at the workshop. One was regarding the IMC "religion" so fervently practiced by many attendees.

[13] Masoud has a consortium of oil companies that are interested in oil reservoir control techniques.

[14] Cole Brosilow, during one of his lectures, claimed to have some half-baked ideas.

[15] Many of us spent an inordinate amount of the time at the piano bar, listening to music and surviving the constant verbal abuse from Barbara, the pianist.