Short Course Initiative

October 2019

Short Course Committee:
Stefano Coraluppi (Chair), Lorenzo Lo Monte, Laila Moreira, Luke Rosenberg, Michael Wicks, Jason Williams
Judy Scharmann (Administrative Support)
Overview

- AESS Short Course (ad hoc) Committee was first established in 2018

- Business model
  - 1-5 day courses to be hosted by AESS Chapters
  - Provides a lengthier presentation than DL program, allowing educational/professional development
  - Fee for participation. AESS Chapter covers speaker/venue honorarium and costs (with seed money). Surplus 20% to AESS, 80% to Chapter

- Program info is available online
  - [http://ieee-aess.org/short-course](http://ieee-aess.org/short-course)
Current course offerings

- Introduction to Airborne Radar
  - Hugh Griffiths
  - 3-day course

- Introduction to Electronic Warfare
  - Lorenzo Lo Monte
  - 1-5 day course
Current course offerings

- Radar Systems Prototyping
  - Lorenzo Lo Monte
  - 1-2 day course

- Over-The-Horizon Radar
  - Giuseppe Fabrizio
  - 1-day course
Current course offerings

- Basic Algorithms for Target Tracking
  - David Crouse
  - 2-day course

- Introduction to Systems Engineering
  - Bob Rassa
  - 1-2 day course
Current course offerings

- Radar Fundamentals
  - Maria S. Greco
  - 5-day course

- Inertial Navigation Systems and Aiding
  - Michael Braasch
  - 1-5 day course
Current course offerings

- Knowledge Based Radar Signal, Image, and Data Processing
  - Michael Wicks
  - 2-day course

- Machine and Deep Learning for Data Fusion
  - Subrata Das
  - 1-2 day course
Completed and planned courses

- Seven courses held to date (four in 2019)
- Initial planning for 2020 courses
  - Crouse (Boston)
  - Fabrizio (Brazil)
  - Rassa (DC area)
  - Wicks (Dayton)
Example of Recent Course

IEEE South Australia Section, C&AES Chapter
Basic Algorithms for Target Tracking

Date: 17-18 June 2019
Time: 9:00 am - 5:00 pm
Venue: Ingkarni Wardi 218 Collaborative Teaching Suite
       University of Adelaide
       North Terrace Adelaide
Registration through Eventbrite
Early bird registration closes May 3 2019

Course Content*

1) Introduction
2) Basic Estimation
   - Mathematical Concepts
   - Mathematical Coordinate Systems
   - Signal Processing Topics
   - Measurement Conversion
   - Parameter Estimation
   - Bayesian Estimation
   - Assessing Estimator Performance
   - Nonlinear Measurement Updates
   - Track Initiation
   - Linear Dynamic Models
3) Nonlinear Dynamics
   - Deterministic Differential Equations
   - Stochastic Dynamic Models
   - Nonlinear Continuous-Time Propagation
   - Celestial and Terrestrial Coordinate Systems
   - Basic Orbital Dynamics
4) Estimation with Model Mismatches
   - Simple Robustness Techniques
   - Alternative Filters
   - Multiple Model Algorithms
5) Target-Measurement Association
   - Cost Functions for Measurement Assignment
   - Single-Scan Assignment Algorithms
   - Comments on Beams
   - Single Scan Track Confirmation and Termination
   - Offline Performance Prediction
   - Multiframe Assignment
6) Estimation with High Nonlinearity
   - Particle Filtering
   - Particle Flow Filtering
   - Track Initiation with Any Type of Measurement

* Final content may differ slightly.
Current priorities

- Expand “supply”
  - Engage AESS Chapter Chairs
  - Direct targeting of DLs, tutorial speakers, panel members

- Expand “demand”
  - Engage AESS Chapter Chairs
  - Advertise regularly in QEB and Systems Magazine
  - Coordinate with VP Industry

- Facilitate logistics
  - Flexibility on funding model (allow low-profit events)
  - Flexibility on host model (conduct AESS-run event)
    (https://www.ieee.org/conferences/organizers/conference-application-form.html)
Further information

- See [http://ieee-aess.org/short-course](http://ieee-aess.org/short-course)

- Resources include
  - Instructor application
  - Sample course advertising flyer
  - IEEE vTools information to manage registrations and payments
  - Budget template

- Contacts
  - Stefano Coraluppi ([stefano.coraluppi@ieee.org](mailto:stefano.coraluppi@ieee.org))
  - Judy Scharmann ([j.scharmann@conferencecatalysts.com](mailto:j.scharmann@conferencecatalysts.com))