Short Course Initiative

April 2019

Short Course Committee:
Stefano Coraluppi (Chair), Lorenzo Lo Monte, Luke Rosenberg, Michael Wicks, Jason Williams
Background

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

- Business model
  - 1-3 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/aess-short-course](http://ieee-aess.org/aess-short-course)
Background

- Short courses to date
  - Fabrizio, South Australia Section, CSS/AESS Chapters, Nov 2015 (1 day)
  - Lo Monte, South Australia Section, CSS/AESS Chapters, Nov 2017 (3 days)
  - Lo Monte, Germany Section, AESS Chapter, Oct 2018 (2 days)
  - Lo Monte, USA Air Force LCMC, Aug 2019 (5 days)
  - Crouse, South Australia Section, CSS/AESS Chapters, Jun 2019 (2 days)

- Instructors
  - Greco, Griffiths, Fabrizio, Lo Monte, Koch, Crouse
Upcoming course (Crouse)

IEEE South Australia Section, C&AES Chapter

Two Day Workshop
Basic Algorithms for Target Tracking

The IEEE SA Section and C&AES Chapter invites you to attend a two day workshop by Dr David Crouse - Radar Division, Naval Research Laboratory USA

About the workshop:
This course goes through a variety of components that arise in target tracking algorithms, with a focus on single-scan algorithms. In many areas, reference is made to functions in the open-source copy left-free Tracker Component Library (available online) so that attendees can rapidly apply the algorithms that are discussed. The presentation slides containing additional derivations will be made available. A full course outline is given on the next page.

About the presenter:
David Frederic Crouse received B.S., M.S., and Ph.D. degrees in Electrical Engineering in 2005, 2008, and 2011 from the University of Connecticut (UCONN). He also received a B.A. degree in German from UCONN for which he spent a year at the Ruprecht-Karls Universität in Heidelberg, Germany. He is the recipient of the 2016 Young Investigator Award from the International Society on Information Fusion and the recipient of a 2016 Alan Barman Research Publication award from the Naval Research Laboratory for the paper 'Basic Tracking Using Nonlinear Continuous-Time Dynamic Models.' He is currently employed at the Naval Research Laboratory in Washington, D.C. and serves as associate editor in chief at the IEEE Aerospace and Electronic Systems Magazine.

Date: 17-18 June 2019
Time: 9:00 am - 5:00 pm
Venue: Ingham Wardle 218 Collaborative Teaching Suite
University of Adelaide
North Terrace Adelaide
Registration through Eventbrite

Early bird registration closes May 3 2019

Attendance Costs (ex. GST)

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<thead>
<tr>
<th>Category</th>
<th>Early Bird</th>
<th>Regular</th>
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<tr>
<td>DST Group Employee (course sponsor)</td>
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<tr>
<td>Non IEEE Member</td>
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<td>IEEE Student**</td>
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<td>$300</td>
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* DST Group employees and students need to show ID when registering.
** IEEE membership discount applies to current IEEE members.

Contact:
Luke Rosenberg
IEEE SA Section, C&AES Chair
Phone: 0421082418
Email: luke.rosenberg@ieee.org

Course Content*

1) Introduction
2) Basic Estimation
   - Mathematical Concepts
   - Mathematical Coordinate Systems
   - Signal Processing Topics
   - Measurement Conversion
   - Parameter Estimation
   - Bayesain 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

- **Update/maintain website**
  - Add summary of short-course logistics
  - For each course, specify nominal course title/summary/duration – not just “technical areas of interest”

- **Identify instructors and advertise offerings**
  - Potential: Das, Smith, Wicks
  - Advertise regularly in QEB and Systems Magazine
  - Direct, targeted approach (DLs, tutorial speakers, ...)
  - Email to be sent to all Chapter Chairs ([http://ieee-aess.org/chapters/all](http://ieee-aess.org/chapters/all))
Open question

Flexibility on funding model
- Request from Bolivia Section Chair

Mi name is Paola Escobari and I am the IEEE Bolivia Section Chair, we don't have an AESS chapter open yet but we are organizing a big event of aerospace in October to engage students and young professionals in this area, we would like to have a short course as part of this event, but the costs and budget detailed on the example in the webpage are extremely expensive for any country in south america.

I would like to know how likely is to treat a short course as a DLT so the section will only pay the costs inside the countries (food, hotel and local transportation). Of course some other sections can be part of the DLT so the cost can be reduced.
Backup
Short Course Initiative

Chapter Summit
April 26, 2018
AESS Board of Governors Meeting
April 27-28, 2018
Oklahoma City, OK, USA
Background

• Many AESS chapters have insufficient revenue to organise events, especially with external speakers.
• The Short Course Initiative was conceived back in May 2015 by then VP Education, Joe Fabrizio.
• He ran a pilot program in November of 2015 by giving a one-day workshop himself, drawing in many participants and proved his idea as successful, raising around AUS$10K for the local chapter.
• The South Australia Chapter ran a second “pilot” in 2017, bringing AESS Distinguished Lecturer, Lorenzo Lo Monte in to give a multi-day course, with equal success - 45 participants and AUS$15K profit.

• Short courses offer the opportunity to fund high quality speakers, provide useful training, engage with the local community and raise revenue which can be directed towards further events.
• Courses can be offered to industry, government laboratories and academia – these organisations typically have training budgets.
Organisation

- We recognise that the details of every course will be different.
- This outline provides some general guidance to assist in the planning.
- Short course organiser – should be the local AESS chapter chair with support from other local members.

- First step is to find a topic which will provide a reasonable audience.
  - Contact colleagues to find areas they would like training.
  - Reach out to large companies / research institutes in the local area.
  - Create an online survey for local IEEE members.
  - Contact the AESS industry relations and / or education organiser for advice (www.ieee-aess.org).
Organisation

• Find a speaker and agree on the date.
  • This may be someone from the short course website or someone known in the local industry.
  • Contact the respective AESS technical panel and / or education committee for ideas.
  • Must first be approved by the AESS short course committee.
• Clarify details of the topic to be covered, duration of course and whether they would be prepared to give multiple courses in different (nearby) locations.
• Venue – Should be accessible for all attendees.
  • Requires seats / tables / projector / screen / lectern.
  • If possible, record presentation – see guide for recording presentations on the short course website.
  • Should hold between 10-50 attendees.
  • Be near public transport / suitable car parking.
Budget - planning

- Goal is to keep costs as low as possible to attract a large audience.
- Instructors should be offered an honorarium (although not everyone will be able to accept it).
- AESS can provide seed money of US$2500 to help with initial course expenses (then paid back from the course profits).
- All expenses of the instructor should be covered. They are expected to travel economy and stay at a hotel near the venue.
- Course costs should be chosen to match the expected expenses (see example spreadsheet for planning).
- Offer different pricing for IEEE members / non members and students.
- Profit should be split 80/20 with the local chapter / AESS.
Budget – risks

- There may be financial losses due to poor attendance.
- To reduce risk we suggest:
  - Set an early bird payment date (~30 days before the course) to attract early registrations.
  - If sufficient registrations are not achieved by this date, then make it clear that the course may be cancelled and fees refunded.
  - AESS short course committee can offer advice if there are any concerns.
  - Chapter chairs should book venues / flights with the ability to cancel if necessary (i.e. flight insurance).
  - Only after the course is deemed ok to proceed, should funds be committed.
# Budget - planner

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<td>Tax</td>
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<th>Income:</th>
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<tr>
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<td>Avg cost per day</td>
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<tr>
<td>Estimated number of attendees</td>
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<tr>
<td>Number of days</td>
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<td>AESS profit (20%)</td>
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Registration - vTools

• Course can be organised with the IEEE vTools.
  • This is a free service offered by the IEEE (http://sites.ieee.org/vtools/)
  • Automatically connected to the L31 reporting tools.
  • Can manage registrations and send bulk emails.

• In the USA - manages credit card payments and interfaces with the concentration bank accounts.
• Easier to manage if the local AESS chapter has their own bank account separate to the section.
• At this time, vTools Payment is still being developed for countries outside the US and Canada. An update will be provided as the payment method is formalized.
Advertising

• Create a flyer for advertising with all the required information.
  • Using vTools, send an eNotice to the local (and nearby) AESS sections.
  • Post it on the local (and nearby) IEEE section websites.
  • Using your networks, forward the flyer to local companies and universities.
AESS Instructors

- A list of AESS short courses and instructors will soon be compiled for the short course web site.
- If you would like to sign up as an instructor, the expectation is:
  - You provide a list of topics which are vetted by the short course committee.
  - Course topics are not to be too technical or too generic unless the audience has agreed to the content.
  - Agree to perform the course as a volunteer or with an agreed upon honorarium.
  - Be prepared to travel internationally.
- The slides are owned by the instructor, but if they agree to be recorded to have it included on the AESS Resource Center, they will sign a Copyright Form, and the slides will be posted as well.
Course example

- Luke met with Lorenzo Lo Monte at the Seattle radar conference about a potential course.
- Luke then surveyed his organisation (Defence Science and Technology Group) to identify the greatest training need.
- Lorenzo Lo Monte agreed to visit Adelaide, South Australia and give a three day course on rapid systems prototyping and electronic warfare in November 2017.
- Lorenzo provided a short description of each day and Luke advertised the it as a Distinguished lecture course.
Course example

- Lorenzo could not accept payment, and his company offered to pay for accommodation.
- SA chapter paid for flights with insurance in case of cancellation.
- Fees were set low and an early bird deadline was set well in advance of the course.
- Manually organised registration and credit card payments – not ideal.
- 19 registrations by the early bird date – decided to go ahead with course.
- Organised printing of course notes, catering, venue at local university and drinks function on the second night.
- Final number of registrations were 45 and profit exceeded AUS$15K.
Ideas for AESS events

- Outreach and networking events:
  - Bring a work colleague along to a sponsored event with a local member highlights the benefits of joining the AESS.
  - Industry networking event for students and young professionals.
- Sponsorship of student events
  - Conference travel for accepted papers
  - Student paper awards at conferences
  - Student competitions
Summary of Resources

- Website: [www.ieee-aess.org](http://www.ieee-aess.org)
- Contact email address: [admin@ieee-aess.org](mailto:admin@ieee-aess.org)
- AESS short course committee:
  - Luke Rosenberg
  - Lorenzo Lo Monte
  - Judy Scharmann
  - Jason Williams
  - Joe Fabrizio

- Resources on the website:
  - List of approved instructors
  - Example budget and spreadsheet for course management
  - Short course recording guide
  - vTools tutorial
  - Example advertising flyer (.pub and .pdf)