



Tactical and Strategic Missile Guidance

13-15 October 2010

Presenter: Mr Paul Zarchan, MIT USA

Conference Centre Technology Park, Mawson Lakes SA

About Tactical and Strategic Missile Guidance

The course will be conducted from 9.00am to 5.00pm. Morning tea will be available at approximately 10.00am to 10.30am, lunch from 12.30pm to 1.30pm and afternoon tea at approximately 3.00pm to 3.30pm.

Whether you work in the tactical world or the strategic world, this **three-day** course will help you understand and appreciate the unique challenges of each. So everyone can clearly understand the principles of both tactical and strategic missile guidance, concepts are derived mathematically, explained from a heuristic perspective, and illustrated with numerical examples. You will find out why missile guidance is not a minor engineering detail and you will discover how to use course source code effectively. Course mathematics and examples are non-intimidating.

This course will benefit managers, engineers, and programmers at all levels who work with or need to learn about interceptor guidance system technology. The heuristic arguments and numerous examples will give managers an appreciation for guidance so that they can interact effectively with specialists. Engineers and programmers will find the detailed course material and many source code listings invaluable for both learning and reference.

Brief Course Outline

Registration Fee:
AU\$1980 (including GST)

Group and PhD student discounts available. Please enquire.

- Tactical Missile Guidance:** Proportional navigation; Important closed-form solutions and their utility;
- Method of Adjoints:** Analysis of missile guidance systems using adjoints;
- Noise Analysis:** Simulating noise, stochastic adjoints; Monte Carlo results;
- Proportional Navigation and Miss Distance:** Useful design relationships for rapid guidance system sizing;
- Digital Noise Filters:** Digital noise filter properties and system performance;
- Advanced Guidance Laws:** Deriving optimal guidance laws without optimal control theory
- Kalman Filters and the Homing Loop:** Combining Kalman filtering and optimal guidance and optimal guidance techniques;
- Endoatmospheric Ballistic Targets:** Speed, Re-entry angle, Ballistic coefficient;
- Extended Kalman Filtering:** Performance comparison of linear, linearized, and extended Kalman filters;
- Other Forms of Tactical Guidance and Tactical Zones:** Beam rider, command to line-of-sight guidance plus drag and acceleration factors;
- Strategic Considerations:** Gravitation and its impact on performance;
- Boosters:** Using the rocket equation and an introduction to gravity turn steering; Lambert Guidance;
- Miscellaneous Topics and T4 Guidance:** Gravity compensation, pulsed and burnout guidance; predictor-corrector method;
- Radome Slope Estimation:** Dither signals and bandpass filtering.

About the Presenter

Mr Paul Zarchan has more than 40 years of experience designing, analyzing, and evaluating missile guidance systems. He has worked as Principal Engineer for Raytheon Missile Systems Division, has served as Senior Research Engineer with the Israel Ministry of Defense and was a Principal Member of the Technical Staff for C.S. Draper Laboratory. Mr. Zarchan is currently a Member of the Technical Staff at MIT Lincoln Laboratory and is working on problems related to missile defense.

For details of further courses please see our web site: www.nicta.com.au/short_courses or contact the NICTA Industry Education Manager.

About NICTA and Short Course Program

National ICT Australia (NICTA) is Australia's ICT Centre of Excellence and was established to drive innovation through high quality research, research training and technology transfer. As a world-class research institute NICTA uniquely combines excellence in research, education, commercialisation and collaboration. We are working to ensure that Australia is well placed to benefit from the significant opportunities that ICT research delivers.

NICTA is funded by the Australian Government as represented by the Department of Communications, Information Technology and the Arts and the Australian Research Council through *Backing Australia's Ability* and the ICT Centre of Excellence program. NICTA members are the Australian Capital Territory Government, the New South Wales Government, the University of New South Wales and the Australian National University.

NICTA short courses offer scientists, engineers and managers technical training with a leading edge in areas such as telecommunications, transport, security, defence, logistics, e-government, mining, finance and biotechnology.

There will be ample opportunities for discussion and questions and answers. Morning and afternoon tea/coffee and a light lunch will be provided. Extensive workshop materials will be made available to participants.

How to register

Please complete the registration form below and

- Fax it to +61 8 8343 8711 or
- Scan and email it to industryeducation@nicta.com.au.

Send the form as soon as possible to secure your place.

For further information please contact
Anne-Marie Eliseo
Industry Education Manager
Telephone: +61 8 8343 8710
Email: anne-marie.eliseo@nicta.com.au

Registration Form and Tax Invoice* ABN 62 102 206 173

*Upon completion of this form, including the relevant payment, this form will become a Tax Invoice.

Please register me for and Strategic Missile Guidance on 13-15 October 2010.

PLEASE PRINT

Date: _____

Title: _____ First Name: _____ Surname: _____

Position: _____ Organisation/Division: _____

Postal Address: _____

Telephone No: _____ Facsimile No: _____ Email: _____

Dietary preference: _____

Course Fees: Full fees: AU\$1980 (incl. GST)

Method of Payment (please tick below):

Cheque (payable to National ICT Australia Ltd)

Please forward the cheque and a copy of THIS registration form to:

Anne-Marie Eliseo, Industry Education Manager, NICTA, SPRI Bld, Mawson Lakes Boulevard, Mawson Lakes SA 5095, Australia.

Credit Card: Credit Card No.: _____ Expiry Date: _____

Visa Master Card Name on card: _____

Amount: AU\$ _____ Signature: _____ Tick if receipt required

Email address of card holder: _____

Electronic Funds Transfer

Please advise by email to Annette Van Bramer

annette.vanbramer@nicta.com.au

when payment is made

BANK	Commonwealth Bank of Australia
ACCOUNT NAME	National ICT Australia Limited
BSB	062 900
ACCOUNT NUMBER	1032 4576
REFERENCE NUMBER	131010

FAX the form to + 61 8 8343 8711 or EMAIL it to industryeducation@nicta.com.au

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Phone NICTA's Industry Education Manager on +61 8 8343 8710.