

Advances in Missile Guidance, Control, and Estimation (Automation and Control Engineering)

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Stringent demands on modern guided weapon systems require new approaches to guidance, control, and estimation. There are requirements for pinpoint accuracy, low cost per round, easy upgrade paths, enhanced performance in counter-measure environments, and the ability to track low-observable targets. **Advances in Missile Guidance, Control, and Estimation** brings together in one volume the latest developments in the three major missile-control components?guidance, control, and estimation?as well as advice on implementation. It also shows how these elements contribute to the overall missile design process.

Shares Insights from Well-Known Researchers and Engineers from Israel, Korea, France, Canada, the UK, and the US

The book features contributions by renowned experts from government, the defense industry, and academia from the United States, Israel, Korea, Canada, France, and the United Kingdom. It starts from the ground up, developing equations of missile motion. It reviews the kinematics of the engagement and the dynamics of the target and missile before delving into autopilot design, guidance, estimation, and practical implementation issues.

Covers Nonlinear Control Techniques as Well as Implementation Issues

The book discusses the design of autopilots using new nonlinear theories and analyzes the performance over a flight envelope of Mach number and altitude. It also contains a chapter on the recent integrated-guidance-and-control approach, which exploits the synergy between the autopilot and guidance system design.

The book then outlines techniques applied to the missile guidance problem, including classical guidance, sliding mode-based, and differential game-based techniques. A chapter on the use of differential games integrates the guidance law with the estimation of the target maneuver. A chapter on particle filter describes the latest development in filtering algorithms. The final chapters?written by engineers working in the defense industry in the US, Israel, and Canada?consider the design and implementation issues of a command-to-line-of-sight guidance system and autopilots.

An Invaluable Resource on the State of the Art of Missile Guidance

A guide to advanced topics in missile guidance, control, and estimation, this invaluable book combines state-of-the-art theoretical developments presented in a tutorial form and unique practical insights. It looks at how tracking, guidance, and autopilot algorithms integrate into a missile system and guides control system designers through the challenges of the design process.

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Advances in Missile Guidance, Control, and Estimation (Automation and Control Engineering) From CRC Press Bibliography

- Sales Rank: #2887172 in Books
- Published on: 2012-09-05
- Original language: English
- Number of items: 1
- Dimensions: 9.20" h x 1.70" w x 6.20" l, 2.55 pounds
- Binding: Hardcover
- 720 pages

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Editorial Review

Review

"…**Advances in Missile Guidance, Control and Estimation** is an edited collection of chapters each written by experts in the field… The introduction develops the missile equations of motion and homing engagement dynamics before introducing autopilot and guidance algorithm development; it then poses some challenges and finishes by summarising the contents of the book."
?*The Aeronautical Journal, January 2013*

About the Author

Missile guidance researchers at major aerospace companies. Researchers & engineers in the government & military.

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From reader reviews:

Dolores Stiger:

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Florence Davis:

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