

Autonomous Systems: Sensors, Vehicles, Security and the Internet of Everything

Monday - Wednesday 16 - 18 April 2018

Conference Sessions At A Glance

[SHOW](#) | [HIDE](#)

- 1: Cyber and Software Security for Autonomous Operations
- 2: Object Sensing for Detection, Classification, and Autonomous Operations
- 3: Networks and the IOT for Autonomous Systems I
- 4: Networks and the IOT of Autonomous Systems II
- 5: Autonomous Operations, Artificial Intelligence, and Navigation I
Posters-Tuesday
- 6: Autonomous Operations, Artificial Intelligence, and Navigation II
- 7: Autonomous Operations, Artificial Intelligence, and Navigation III

Important Dates

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- Abstract Due:
9 October 2017
- Author Notification:
11 December 2017
Notifications will be sent no later than 12/15/17
- Manuscript Due Date:
21 March 2018

Conference Committee

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Conference Chairs

Michael C. Dudzik, IQM Research Institute (United States)
 Jennifer C. Ricklin, Carnegie Mellon Univ.—Software Engineering Institute (United States)

Program Committee

John Audia, Naval Postgraduate School (United States)
 Andrew Dallas, Soar Technology, Inc. (United States)
 Mark Donofrio, Southern Research (United States)
 Brian Hibbeln, Naval Postgraduate School (United States)
 Robert A. Hummel, National Geospatial-Intelligence Agency (United States)
 Herbert W. Klumpe, Air Force Research Lab. (United States)

Program Committee continued...

John Marx, Air Force Research Lab. (United States)
 Brad McNett, U.S. Army TARDEC (United States)
 Matt Mickelson, The MITRE Corp. (United States)
 Frank Prautzsch, Velocity Technology Partners, LLC (United States)
 Jeremy Salinger, General Motors Co. (United States)
 Shawn Taylor, Sandia National Labs. (United States)
 Andrew Williams, Air Force Research Lab. (United States)

MONDAY 16 APRIL

[Show All Abstracts](#)


Session 1: Cyber and Software Security for Autonomous Operations

Monday 16 April 2018
 8:45 AM - 12:00 PM
 Location: Ballroom Level, Miami 1

Session Chairs: Michael C. Dudzik, IQM Research Institute (United States) ; Jennifer C. Ricklin, Carnegie Mellon Univ.—Software Engineering Institute (United States)


Tactical comms, Software, MI/AI, embedded HPC, and big data analytics: OSD vision for future defense system requirements (Keynote Presentation)

Paper 10643-1
 Time: 8:45 AM - 9:30 AM
 Author(s): Richard W. Linderman, Office of the Assistant of the Secretary of Defense (United States)

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Safety enforcement for the verification of autonomous systems

Paper 10643-2
 Time: 9:30 AM - 9:50 AM
 Author(s): Dionisio de Niz, Bjorn Andersson, Gabriel Moreno, Carnegie Mellon Univ.—Software Engineering Institute (United States)

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Coffee Break 10:10 AM - 10:40 AM

Adopting cyber security practices in Internet of Things: a review

Paper 10643-5

Time: 11:00 AM - 11:20 AM


Author(s): Priti Maheshwary, Timothy Malche, AISECT Univ. (India); Christos Grecos, Central Washington Univ. (United States); Mukul V. Shirvaikar, The Univ. of Texas at Tyler (United States)

[Add To My Schedule](#) **Maintaining trusted platform in a cyber-contested environment**

Paper 10643-6

Time: 11:20 AM - 11:40 AM


Author(s): David Hadcock, Matthew Britton, Bruce Frantz, Michael Lynch, Alion Science and Technology Corp. (United States)

[Add To My Schedule](#) **Certificates, code signing and digital signatures**

Paper 10643-7

Time: 11:40 AM - 12:00 PM

Author(s): Michael Anderson, The PTR Group (United States)

[Add To My Schedule](#) 

Lunch Break 12:00 PM - 1:20 PM

**Session 2:
Object Sensing for Detection, Classification, and Autonomous Operations**

Monday 16 April 2018

1:20 PM - 4:10 PM

Location: Ballroom Level, Miami 1


Session Chairs: Richard W. Linderman, Office of the Assistant Secretary of Defense (United States) ; Michael C. Dudzik, IQM Research Institute (United States)

CNN-based thermal infrared person detection by domain adaptation

Paper 10643-8

Time: 1:20 PM - 1:40 PM


Author(s): Christian Herrmann, Miriam Ruf, Jürgen Beyerer, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

[Add To My Schedule](#) **Evaluation of a logarithmic HDR sensor for an image-based navigation system**

Paper 10643-9

Time: 1:40 PM - 2:00 PM


Author(s): Marco Tektonidis, Mateusz Pietrzak, David Monnin, Institut Franco-Allemand de Recherches de Saint-Louis (France)

[Add To My Schedule](#) **Improved video change detection for UAVs**

Paper 10643-11

Time: 2:00 PM - 2:20 PM


Author(s): Thomas Müller, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

[Add To My Schedule](#) **Unattended sensor using deep machine learning techniques for rapid response applications**

Paper 10643-12

Time: 2:20 PM - 2:40 PM

Author(s): Alfred Mayalu, Kevin Kochersberger, Virginia Polytechnic Institute and State Univ. (United States)

[Add To My Schedule](#) **Towards development of enhanced pedestrian safety awareness at crosswalks via networked LiDAR, thermal imaging and augmented reality (Canceled)**

Paper 10643-13

Time: 2:40 PM - 3:00 PM

Author(s):


Coffee Break 3:00 PM - 3:30 PM

Hydra: a modular, universal multi-sensor data collection system

Paper 10643-14

Time: 3:30 PM - 3:50 PM


Author(s): Madelyn Davis, Lucas Cagle, Courtney Morgan, Christopher R. Hudson, Bostic Shell, David Gardner, Muhammad A. Islam, Cindy L. Bethel, John E. Ball, James R. Gafford, Derek T. Anderson, Yucheng Liu, Andrew LeClair, Mississippi State Univ. (United States)

[Add To My Schedule](#) **Low-cost 3D security camera**

Paper 10643-15

Time: 3:50 PM - 4:10 PM

Author(s): Robert Bock, R-DEX Systems, Inc. (United States)

[Add To My Schedule](#) **TUESDAY 17 APRIL**[Show All Abstracts](#)

Session 3: Networks and the IOT for Autonomous Systems I

Tuesday 17 April 2018

8:35 AM - 10:00 AM

Location: Ballroom Level, Miami 1


Session Chairs: Jeremy Salinger, General Motors Co. (United States) ; Brad McNett, U.S. Army TARDEC (United States)

Trust in autonomy: From self-driving cars to big data analytics (*Keynote Presentation*)

Paper 10643-16

Time: 8:35 AM - 9:20 AM


Author(s): Stephen M. Jameson, Defense Advanced Research Projects Agency (United States)

[Add To My Schedule](#) **A history and overview of mobility modeling for autonomous unmanned ground vehicles**

Paper 10643-17

Time: 9:20 AM - 9:40 AM

Author(s): Phillip J. Durst, Gabe Monroe, U.S. Army Engineer Research and Development Ctr. (United States); Cindy L. Bethel, Derek T. Anderson, Daniel W. Carruth, Mississippi State Univ. (United States)

[Add To My Schedule](#) **Coffee Break and Dedicated Exhibition Time 10:00 AM - 11:00 AM**

Session 4: Networks and the IOT of Autonomous Systems II

Tuesday 17 April 2018

11:00 AM - 12:00 PM

Location: Ballroom Level, Miami 1


Session Chairs: Jeremy Salinger, General Motors Co. (United States) ; Brad McNett, U.S. Army TARDEC (United States)

Mission critical decentralized resilient and intelligent control for networked heterogeneous unmanned autonomous systems (*Conference Presentation*)

Paper 10643-19

Time: 11:00 AM - 11:20 AM


Author(s): Hao Xu, Univ. of Nevada, Reno (United States)

[Add To My Schedule](#) **Acoustic data communication by wireless sensor network on plate-like structures for autonomous structural health monitoring of aerovehicles**

Paper 10643-20

Time: 11:20 AM - 11:40 AM

Author(s): Tonmo Fepeussi, Illinois Institute of Technology (United States), Univ. of Maryland Eastern Shore (United States); Yuanwei Jin, Univ. of Maryland Eastern Shore (United States); Yang Xu, Illinois Institute of Technology (United States); Dan Xiang, X-wave Innovations, Inc. (United States); Feng Huo, X-wave Innovations (United States)

[Add To My Schedule](#) **Lunch/Exhibition Break 12:00 PM - 1:40 PM**

Session 5: Autonomous Operations, Artificial Intelligence, and Navigation I

Tuesday 17 April 2018

1:40 PM - 4:10 PM

Location: Ballroom Level, Miami 1


Session Chairs: Robert A. Hummel, National Geospatial-Intelligence Agency (United States) ; Michael C. Dudzik, IQM Research Institute (United States)

Adapted deep feature fusion for person re-identification in aerial images

Paper 10643-22

Time: 1:40 PM - 2:00 PM

Author(s): Arne Schumann, Jürgen Metzler, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)


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Probabilistic models for assured position, navigation, and timing

Paper 10643-24

Time: 2:00 PM - 2:20 PM


Author(s): Andres Molina-Markham, The MITRE Corp. (United States)

[Add To My Schedule](#) **Intelligent resource selection for sensor-task assignment: the story so far (Conference Presentation)**

Paper 10643-25

Time: 2:20 PM - 2:40 PM


Author(s): Geeth R. de Mel, IBM United Kingdom Ltd. (United Kingdom); Tien Pham, U.S. Army Research Lab. (United States)

[Add To My Schedule](#) **UAVs for wildland fires**

Paper 10643-23

Time: 2:40 PM - 3:00 PM

Author(s): Moulay A. Akhloufi, Univ. de Moncton (Canada); Nicolas Castro, Universidad Técnica Federico Santa María (UTFSM) (Chile); Andy Couturier, Univ. de Moncton (Canada)

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Coffee Break 3:00 PM - 3:30 PM

A robust abnormal detection method for complex structures in UAV images for autonomous O and M system

Paper 10643-27

Time: 3:30 PM - 3:50 PM


Author(s): Yu Zhao, Jun-ichiro Watanabe, Hitachi, Ltd. (Japan)

[Add To My Schedule](#) **Genetic algorithm for automatic tuning of neural network hyperparameters**

Paper 10643-28

Time: 3:50 PM - 4:10 PM

Author(s): Jakub Safarik, Jakub Jalowiczor, Erik Gresak, Jan Rozhon, CESNET z.s.p.o. (Czech Republic)

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Session PS1: Posters-Tuesday

Tuesday 17 April 2018

6:00 PM - 8:00 PM

Location: Ballroom Level, Osceola Ballroom C

All symposium attendees – You are invited to attend the evening Interactive Poster Session to view the high-quality posters and engage the authors in discussion. Enjoy light refreshments while networking with colleagues in your field. Authors may set up their posters between 10:00 am and 5:00 pm the day of their poster session. Special daytime previewing prior to the session from 10:00 am to 5:00 pm. Attendees are required to wear their conference registration badges to access the Osceola Ballroom to view the posters.


Posters that are not set up by the 5:00 pm cut-off time will be considered no-shows, and their manuscripts may not be published. Poster authors should accompany their posters from 6:00 to 8:00 pm to answer questions from attendees. All posters and other materials must be removed no later than 8:30 pm. Any posters or materials left behind at the close of the poster session will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

The performance analysis for the subspace projection adaptive method under different subarray structures

Paper 10643-26

Time: 6:00 PM - 8:00 PM


Author(s): Dan Wang, Wichita State Univ. (United States); Guanglei Zhang, Harbin Institute of Technology (China)

[Add To My Schedule](#) **1.5mm precision liquid level measurement using impedance spectroscopy**

Paper 10643-36

Time: 6:00 PM - 8:00 PM


Author(s): Bhuwan Kashyap, Iowa State Univ. of Science and Technology (United States); Charles Sestok, Anand Dabak, Srinath Ramaswamy, Texas Instruments Inc. (United States); Ratnesh Kumar, Iowa State Univ. of Science and Technology (United States)

[Add To My Schedule](#) **The float round-off error analysis for linear minimum variance adaptive beamforming**

Paper 10643-38

Time: 6:00 PM - 8:00 PM


Author(s): Dan Wang, Wichita State Univ. (United States); Guanglei Zhang, Harbin Institute of Technology (China)

[Add To My Schedule](#) **The subarray division for the phase array radar**

Paper 10643-39

Time: 6:00 PM - 8:00 PM


Author(s): Dan Wang, Wichita State Univ. (United States)

[Add To My Schedule](#) **Multi-objective optimization for subarray structure of the phase array radar**

Paper 10643-40

Time: 6:00 PM - 8:00 PM


Author(s): Dan Wang, Wichita State Univ. (United States)

[Add To My Schedule](#) **Adaptive monopulse for direction of arrival estimation under mainlobe interference**

Paper 10643-41

Time: 6:00 PM - 8:00 PM


Author(s): Dan Wang, Wichita State Univ. (United States)

[Add To My Schedule](#) **Advanced spatial spectrum estimation at subarray level for phase array radar**

Paper 10643-42

Time: 6:00 PM - 8:00 PM


Author(s): Dan Wang, Wichita State Univ. (United States)

[Add To My Schedule](#) **It's a target-rich environment in the IoT**

Paper 10643-43

Time: 6:00 PM - 8:00 PM


Author(s): Michael Anderson, The PTR Group (United States)

[Add To My Schedule](#) **Technical trade-offs of IoT platforms**

Paper 10643-44

Time: 6:00 PM - 8:00 PM


Author(s): Michael Anderson, The PTR Group (United States)

[Add To My Schedule](#) **Networking 20 billion devices**

Paper 10643-45

Time: 6:00 PM - 8:00 PM


Author(s): Michael Anderson, The PTR Group (United States)

[Add To My Schedule](#) **Cloud versus fog: which model is more secure for the IoT?**

Paper 10643-46

Time: 6:00 PM - 8:00 PM

Author(s): Michael Anderson, The PTR Group (United States)

[Add To My Schedule](#) **Printed self-powered miniature air sampling sensors****(Canceled)**

Paper 10643-47

Time: 6:00 PM - 8:00 PM


Author(s):

IOT honeynet for military deception and indications and warnings

Paper 10643-48

Time: 6:00 PM - 8:00 PM

Author(s): Peter Hanson, Lucas Truax, David D. Saranchak, Concurrent Technologies Corp. (United States)

[Add To My Schedule](#) **Data processing for cyber security at the network edge with fog computing****(Canceled)**

Paper 10643-50

Time: 6:00 PM - 8:00 PM

Author(s):

WEDNESDAY 18 APRIL[Show All Abstracts](#)

Session 6: Autonomous Operations, Artificial Intelligence, and Navigation II

Wednesday 18 April 2018

8:35 AM - 10:00 AM

Location: Ballroom Level, Miami 1


Session Chairs: Brian Hibbeln, Naval Postgraduate School (United States) ; Jennifer C. Ricklin, Carnegie Mellon Univ.—Software Engineering Institute (United States)

Hacking mobility (*Keynote Presentation*)

Paper 10643-29

Time: 8:35 AM - 9:20 AM


Author(s): Craig Smith, Rapid7 (United States)

[Add To My Schedule](#) **Robust hierarchical reasoning over sensor data with the Soar cognitive architecture**

Paper 10643-30

Time: 9:20 AM - 9:40 AM


Author(s): Timothy Saucer, Jacob Crossman, Soar Technology, Inc. (United States)

[Add To My Schedule](#) **Optimizing cooperative cognitive search and rescue UAVs**

Paper 10643-31

Time: 9:40 AM - 10:00 AM

Author(s): Mark D. Rahmes, David Chester, Jodie Hunt, Basil Chiasson, Harris Corp. (United States)

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Coffee Break and Dedicated Exhibition Time 10:00 AM - 11:00 AM

**Session 7:
Autonomous Operations, Artificial Intelligence, and Navigation III**

Wednesday 18 April 2018

11:00 AM - 12:20 PM

Location: Ballroom Level, Miami 1


Session Chairs: Brian Hibbeln, Naval Postgraduate School (United States) ; Jennifer C. Ricklin, Carnegie Mellon Univ.—Software Engineering Institute (United States)

Power line-tree conflict detection and 3D mapping using aerial images taken from UAV

Paper 10643-32

Time: 11:00 AM - 11:20 AM


Author(s): Jun-ichiro Watanabe, Hitachi, Ltd. (Japan); Sanko Ren, Hitachi Solutions, Ltd. (Japan); Yu Zhao, Tomonori Yamamoto, Hitachi, Ltd. (Japan)

[Add To My Schedule](#) **The state of solid-state 3D lidar for autonomous systems**

Paper 10643-33

Time: 11:20 AM - 11:40 AM


Author(s): Frank Bertini, Velodyne LiDAR, Inc. (United States)

[Add To My Schedule](#) **Survivability: a hierarchical fuzzy logic layered model for threat management of unmanned ground vehicles**

Paper 10643-34

Time: 11:40 AM - 12:00 PM

Author(s): Shashank Kamthan, Harpreet Singh, Wayne State Univ. (United States); Thomas J. Meitzler, U.S. Army Tank Automotive Research, Development and Engineering Ctr. (United States)

[Add To My Schedule](#) **Distributed control technology for management of roads with driverless cars**

Paper 10643-35

Time: 12:00 PM - 12:20 PM

Author(s): Peter Sapaty, The National Academy of Sciences of Ukraine (Ukraine)

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