

# Call for Papers



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## 2022 IEEE Virtual International Symposium on Technologies for Homeland Security

November 14 – 15, 2022 • [information@ieee-hst.org](mailto:information@ieee-hst.org)

### Call for Papers

We are pleased to announce that the 21st Annual IEEE Symposium on Technologies for Homeland Security (HST '22), will be held November 14–15, 2022 as a virtual event. This symposium will bring together innovators from leading academia, industry, businesses, Homeland Security Centers of Excellence, and government agencies to provide a forum to discuss ideas, concepts, and experimental results.

HST is produced by IEEE with technical and organizational support from IEEE, IEEE Boston Section, IEEE-USA, MIT Lincoln Laboratory, and Raytheon Technologies. This year's event will once again showcase selected technical papers highlighting emerging technologies in the following areas:

Border Security, Critical Infrastructure  
Protection, and Law Enforcement

Climate Change and  
Homeland Resilience

Cyber Security

Frontier and  
Emerging Technologies

We are currently seeking technical paper submissions in the above areas. This year, the Homeland Security Technology community has come together to respond and develop technology to address the challenges of COVID-19 and we anticipate HST'22 to reflect that focus. Accordingly, all areas are inclusive of technologies related to the global COVID-19 pandemic. Papers examining the feasibility of transition to practice will also be considered. All areas will cover the following common topics:

- Strategy, threat characterization, operational concepts, and risk analysis.
- Modeling, simulation, experimentation, exercises & training.
- Testbeds, standards, performance, and evaluations.

### Contact Information

For more detailed information on the Call for Papers, as well as Sponsorship and Exhibit Opportunities, visit the website: <http://ieee-hst.org/> or email: [information@ieee-hst.org](mailto:information@ieee-hst.org). Submissions should be sent to the following website: <https://cmt3.research.microsoft.com/HST2022/>

### Important Dates *(All deadlines are by midnight Eastern Standard Time)*

Paper Extended Abstract Deadline: June 15, 2022  
Paper Acceptance Notification: August 15, 2022  
Final Paper Submission Deadline: October 15, 2022

### Organizing Committee

General Chair: James Flavin, MIT Lincoln Laboratory  
Technical Chairs: Gerald Larocque, MIT Lincoln Laboratory  
Anthony Serino, Raytheon  
Local Arrangement Chair: Bob Alongi, IEEE Boston  
Sponsorship/Exhibits Chair: Bob Alongi, IEEE Boston  
Special Advisor to the Chair: Lennart Long, EMC Consultant  
Registration Chair: Karen Safina, IEEE Boston

### Technical Program Committee

*Climate Change and  
Homeland Resilience*  
John Aldridge, MIT Lincoln Laboratory  
Deborah Campbell, MIT Lincoln Laboratory  
Lance Fiondella, UMass Dartmouth  
*Border Security, Critical  
Infrastructure Protection,  
and Law Enforcement*  
Bengt Borgstrom, MIT Lincoln Laboratory  
Rich Moro, Raytheon  
Arash Samani, Systems & Technology Research  
Cyber Security  
Hong Liu, UMass Dartmouth  
Firas Glaiel, Raytheon  
Thomas Edgar, Pacific Northwest National Laboratory

# Call for Papers

## **Border Security, Critical Infrastructure Protection and Law Enforcement**

*Track Focus: Technologies to protect borders, critical infrastructure, key resources (CI/KR), population centers, and to facilitate threat detection (including chemical, biological, nuclear, explosives) and counter-terrorism surveillance. Technologies to track responders, improve situational awareness, and better mitigate, respond to, and recover from incidents. Technologies that enable remote detection of unlawful movement or action, and non-invasive transport screening. Biometrics and forensics technologies to aid law enforcement for effective data analysis, identification verification, and evidence evaluation.*

**Topics of interest** to this track include, but are not limited to:

- Detection of hazardous materials, field detection equipment, dispersion tracking
- Machine learning, advanced analytic methods, predictive modeling
- Situational awareness/situational understanding and decision support
- Decontamination and restoration strategies, equipment, approaches, and sensing following WMD events
- Autonomous, robotic, composable, and artificial intelligence for offsetting human response capabilities
- Personnel screening
- Container/Compartment/Vehicle screening (detection, monitoring, and tracking)
- Port (land, sea, and air) and in-between-port surveillance, sensors and intelligence integration and data analytics
- Automated recognition and identification of suspicious objects
- Surveillance and communications (especially in remote environments)
- Multimodal biometrics and new biometrics and novel sensing technologies such as wearable technology applications
- Robust biometrics with respect to standoff, environmental conditions, channel impairments, and adversaries
- Nationwide and international biometric data interoperability and statistical estimation and reporting
- Evaluation of the scientific basis, validity, reliability, and uncertainty of forensic analyses under realistic case scenarios
- Human observer bias and sources of human error with forensic sciences
- Tools and protocols (automated and manual) for forensic examinations, methods, and practices
- Bio/pandemic threats at border crossings/ports of entry
- Detection/mitigation of cyber as well as physical attacks on CI/KR particularly electrical & water grids
- Economic models to support the development & deployment of new technology and enable the transformation of the CI/KR infrastructure

## **Cyber Security**

*Track focus: Technologies to enable rapid and efficient cyber operations while protecting availability, integrity, and confidentiality of information and services. Technologies that enable identification and apprehension of cyber criminals, characterization of cyber adversaries, and effective cyber resilience, control, and mitigation.*

**Topics of interest** to this track include, but are not limited to:

- Host and network security, mobile security technologies, and continuous diagnostics and mitigation
- Cyber and cyber-physical incident response
- Industrial control system/critical infrastructure security
- Security for the Internet of Things, including safety-critical devices
- Cloud infrastructure and platform security
- Cyber event investigations, forensics, and malware analysis
- Applications of artificial intelligence/ machine learning for securing cyber space
- Supply chain security
- Attack and defense modeling and characterization
- Trust models and architectures
- Securing autonomous and cyber-physical systems such as robots

## **Climate Change and Homeland Resilience**

*Track focus: Climate change presents an enduring risk to homeland security across a wide range of specific threat vectors including, increased heat waves, extended droughts, precipitation-based flooding, rising sea levels, and increased frequency and intensity of major storms. These threats impact societal health, critical infrastructure, and economic well-being. The United*

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*States needs to develop and deploy adaptation approaches across multiple geographic and infrastructure sectors and build systems that reduce overall greenhouse gas emissions in parallel to mitigate the worst consequences of climate change. Government leaders at all levels require information to aid in mid- and long-term planning to proactively and effectively adapt to climate risks. This session brings together leaders from industry, academia and government to discuss challenges and solutions to these climate-driven threats to homeland security.*

**Topics of interest** to this track include, but are not limited to:

- Remote sensing and data exploitation to understand climate drivers and impacts
- Risk analysis and adaptation approaches for critical domestic infrastructure
- Power generation, energy, and transportation system resilience approaches and migration to provide clean energy
- Modeling and decision support tools to guide adaptive decision making
- Climate impacts on public health

## Frontier and Emerging Technologies

*Special Topics focus:* New technologies and innovative applications of existing technology with promise to affect Homeland Security that are not covered in other tracks.

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## Instructions for Paper

### Paper Submissions

Prospective paper authors are invited to submit one or more detailed **extended abstracts by June 15, 2022**. The abstracts are to be **three to seven pages in length** (minimum 12 point font) and will serve as the basis for acceptance of papers for the conference. Authors will be notified of the review result (i.e., acceptance or rejection), with any applicable comments, by August 15, 2022. The abstract should include: the authors(s) title, name, address, phone, email and organizational affiliation within the page limit. Attached to this should be a one page or shorter biography of the presenting author.

A **completed paper** is required only from authors receiving a notice of acceptance from the conference. This paper should be prepared in standard IEEE format and not exceed seven pages, including all illustrations and references. Technical papers must not substantially overlap with material published at or simultaneously submitted to another venue. Final paper manuscripts must be submitted by October 15, 2022.

**Please note: Accepted paper submissions require at least one author to register and pay the conference fee.** The organizers of HST, as well as our attendees, expect all accepted papers to be presented at the conference. IEEE reserves the right to exclude a paper from distribution after the conference if the paper is not presented.

All submissions should be made at the following website: <https://cmt3.research.microsoft.com/HST2022/>

### Publishing Information

All papers will be published in the conference proceedings and distributed to conference attendees. Extended versions of selected full technical papers that meet the publishing requirements may be published in selected journals and in the IEEE Xplore as part of the IEEE Conference Publication Program.

## Call for Sponsors and Virtual Exhibitors

A limited number of sponsorships and exhibit packages are available. To learn more, visit the conference website or contact or [sponsorship@ieee-hst.org](mailto:sponsorship@ieee-hst.org).

**For more information on the conference, visit, [www.ieee-hst.org](http://www.ieee-hst.org) or email, [information@ieee-hst.org](mailto:information@ieee-hst.org).**