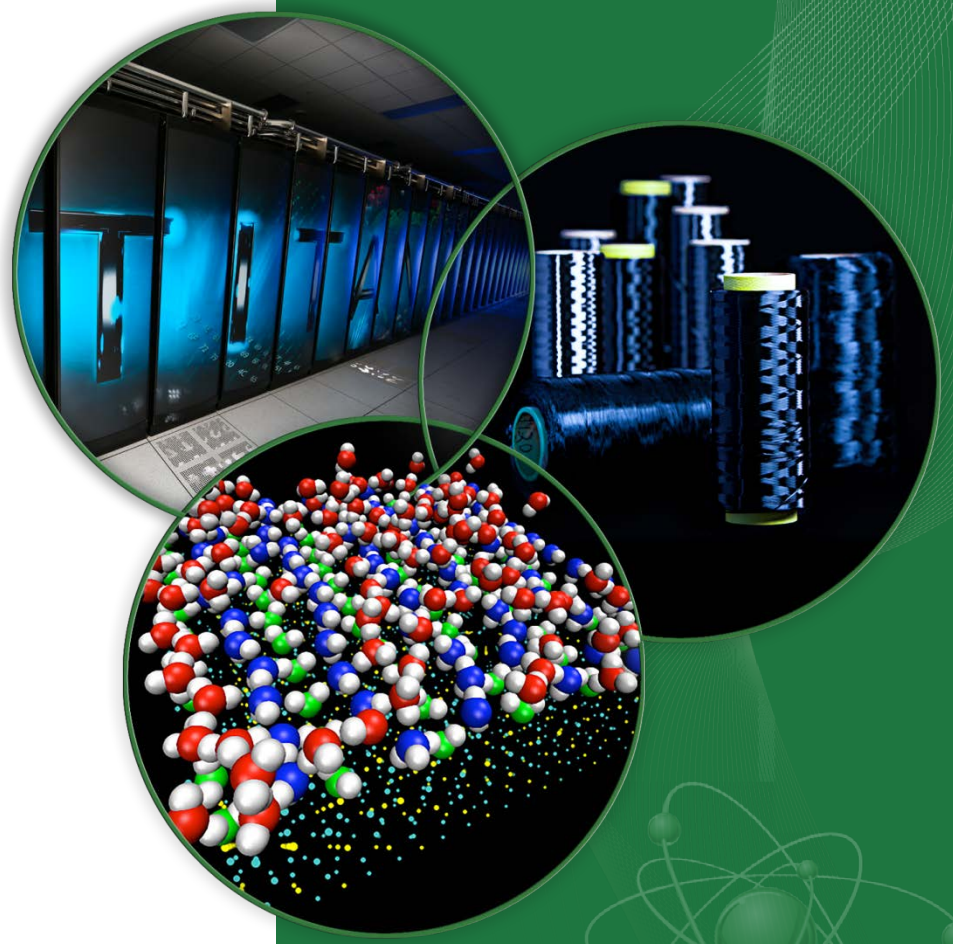
Operationalizing small Unmanned Aerial Systems (sUAS)



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Oak Ridge, Tennessee

May 18, 2017

http://uasresearch.ornl.gov/

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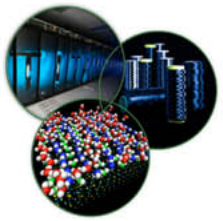
Unmanned Aerial Systems Research Center (UASRC)



ORNL is DOE's largest & most diverse science and energy laboratory

Mission: Deliver scientific discoveries and technical breakthroughs that will accelerate the development and deployment of solutions in clean energy and global security, and in doing so create economic opportunity for the nation—We exploit synergies among our core capabilities to deliver on our mission.

- Leader in Global Security Technologies
- Most powerful open scientific computing facility
- Nation's most diverse energy portfolio
- Nation's largest materials research portfolio
- World's most intense neutron source
- Forefront of decision science and analysis
- $1.5B budget / 4,700 employees
- World-class research reactor

Partner with academia, government, industry

Assemble, distribute and provide data services in support of NASA's Earth science

ORNL DAAC
DISTRIBUTED ACTIVE ARCHIVE CENTER FOR BIOGEOCHEMICAL DYNAMICS

DOE's Oak Ridge Leadership Computing Facility
- TITAN computer operating at >2.7 petaflops (World #1)
- 10–30 PF system in development (OLCF-3)
- **Exascale** system by 2017

NSF National Institute for Computational Sciences
- Cray XT5 Kraken operating at >1 petaflops
- Partnership with the University of Tennessee

NOAA National Climate Computing Research Center
- Cray XE6/XT6 Gaea operating at 700 teraflops
- Petascale

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Unmanned Aerial Systems Research Center






Platforms

Off the Shelf
Payloads
Batteries
Airframes
Engines
Avionics
3D Printing

Sensors

Off the Shelf
PAN
MSI
HSI
TIR
LIDAR
SAR

Computing

Off the Shelf
On Board
On the Ground
Low Power
Small Footprint
Solid State
CPU+GPU

Navigation

With GPS
Without GPS
Programmable
Data-Based
Sensor-Based
Learning-Based
Adaptive

Analytics

On Board
On the Ground
Streaming
Learning-Based
Signatures
3D
Anticipatory

Operation

ISO
FAA
NSF
Universities
Training
Certification
Outreach

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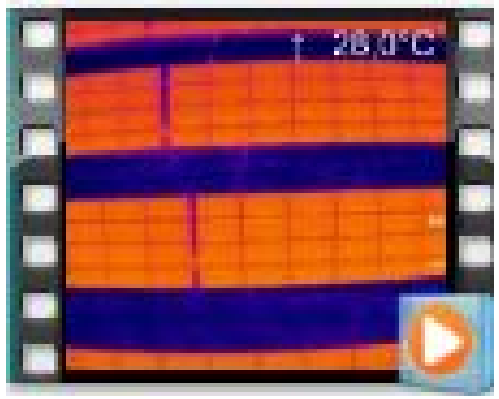
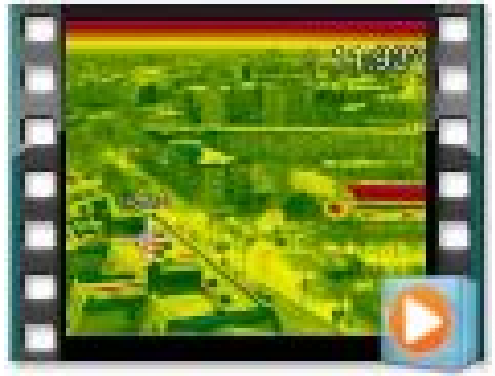
DOE Focused – Energy Applications

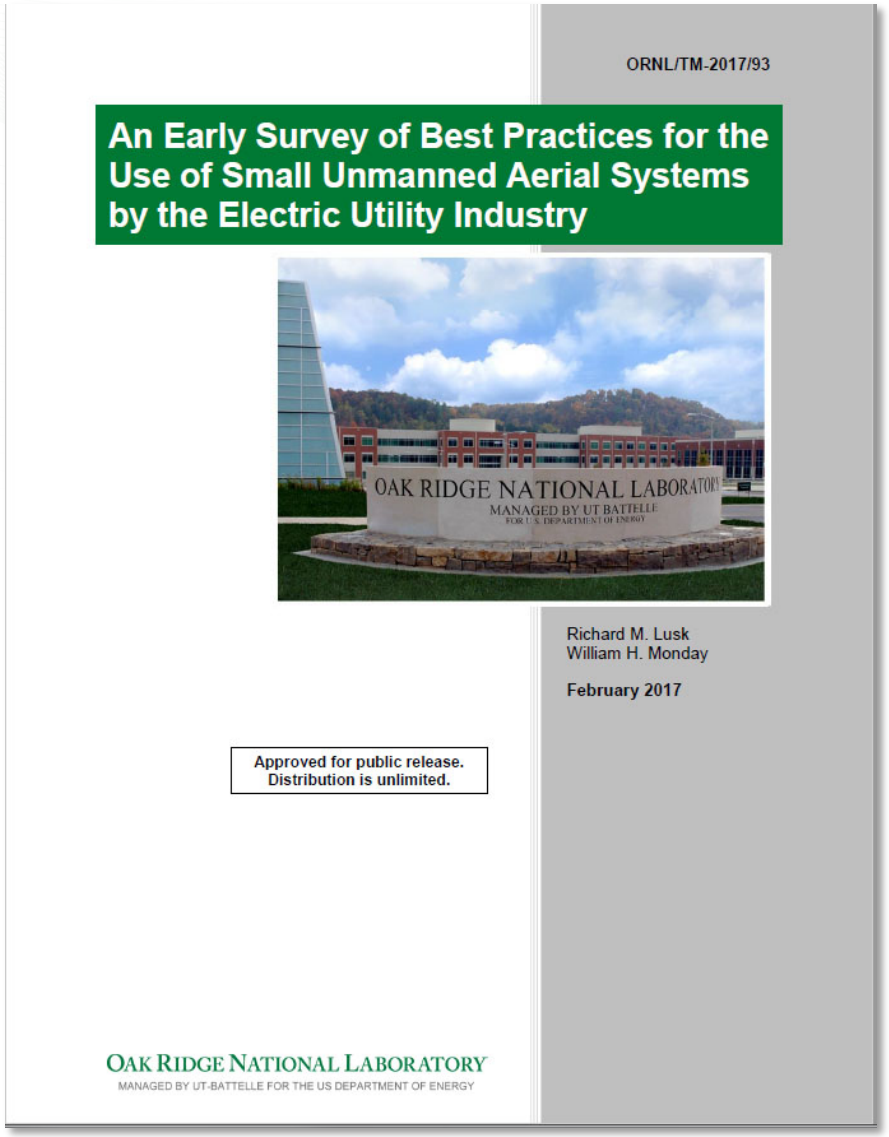
Fig. 1, above: optris PI LightWeight is excellent for maintenance work and quality inspections of solar and wind power systems and also for thermographic surveys of buildings.





Application:
Maintenance and inspections of electrical, solar and wind power systems and also for thermographic surveys of buildings.

An Early Survey of Best Practices for the Use of Small Unmanned Aerial Systems by the Electric Utility Industry



http://info.ornl.gov/sites/publications/Files/Pub73072.pdf

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