The Session on Cyber Security

Automotive Cyber-Physical Security Issues with respect to Anomaly Detection

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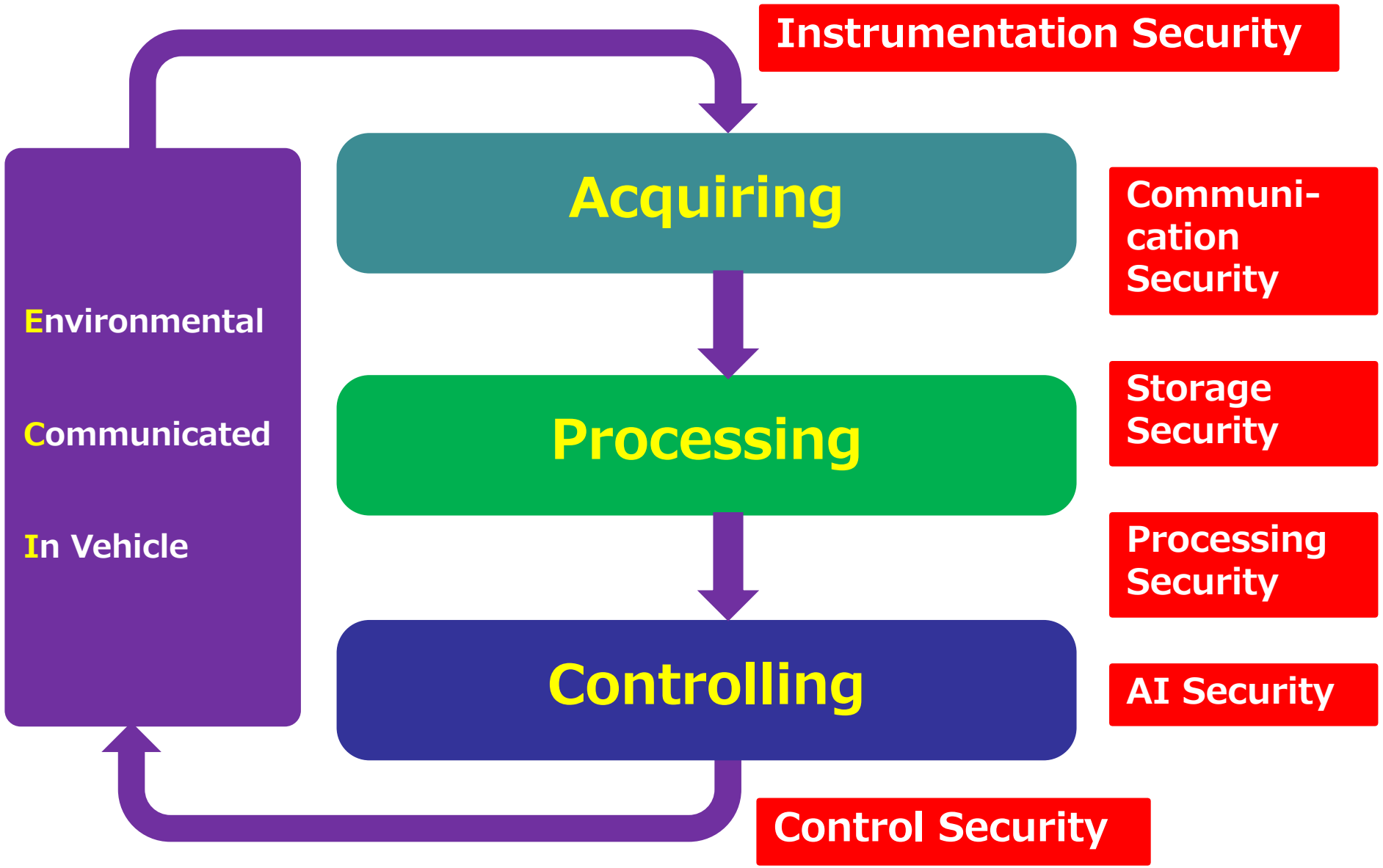
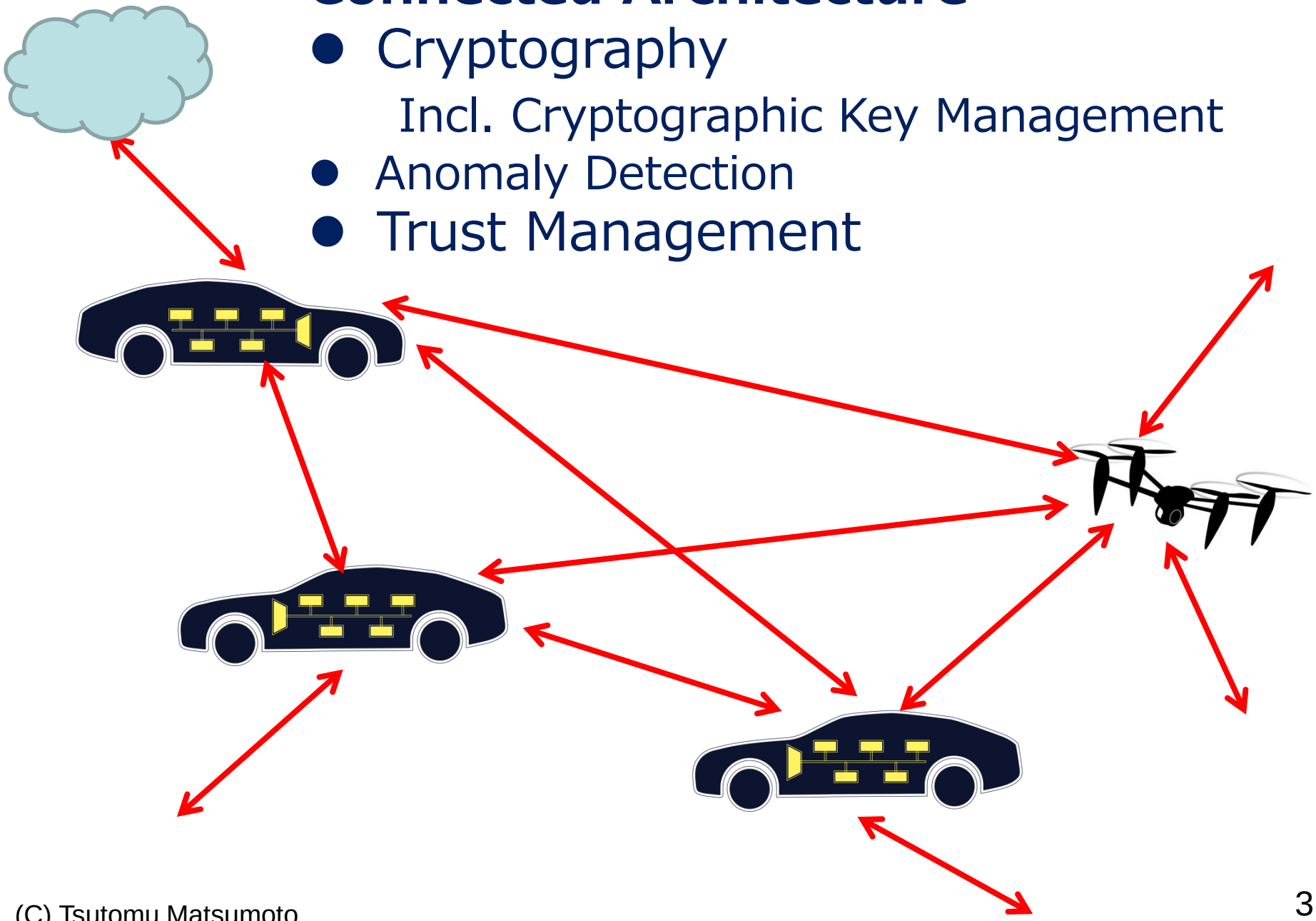
Major Automotive Cyber Physical Security Issues



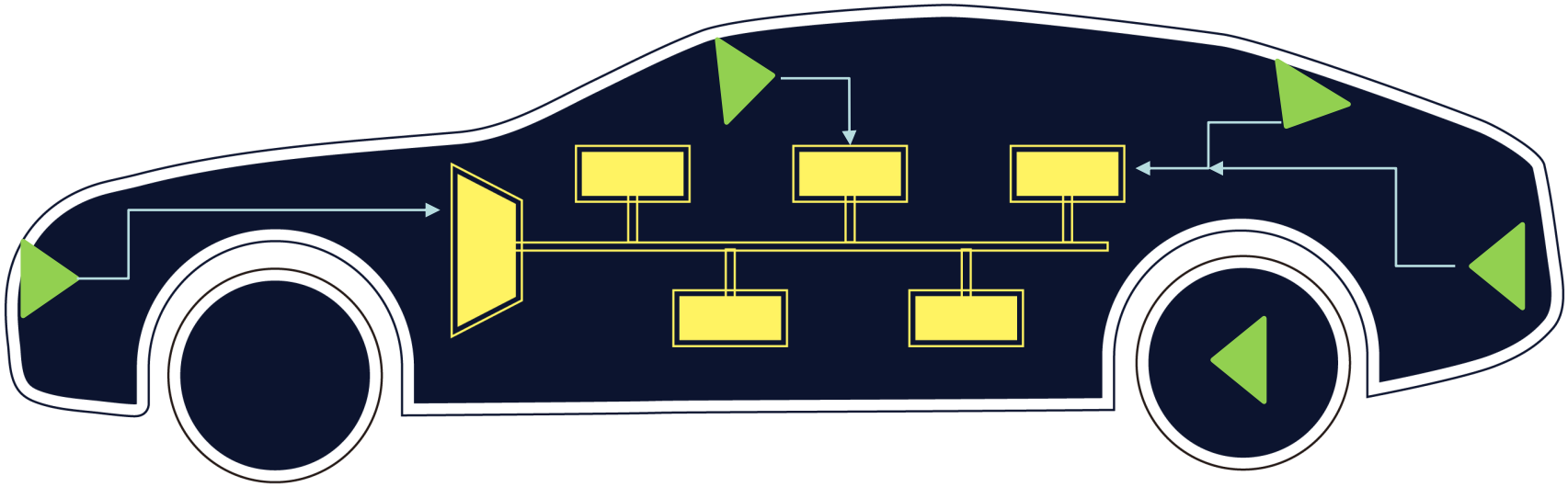
Connected Architecture

- Cryptography
  - Incl. Cryptographic Key Management
- Anomaly Detection
- Trust Management



In-Vehicle Network

- Cryptography
  - Message Authentication Codes
  - Digital Signatures
  - Encryption
- Cryptographic Key Management
- Anomaly Detection
  - Intrusion Detection System
    - ✓ Host Based/ Network Based
- Security Supply Chain Management



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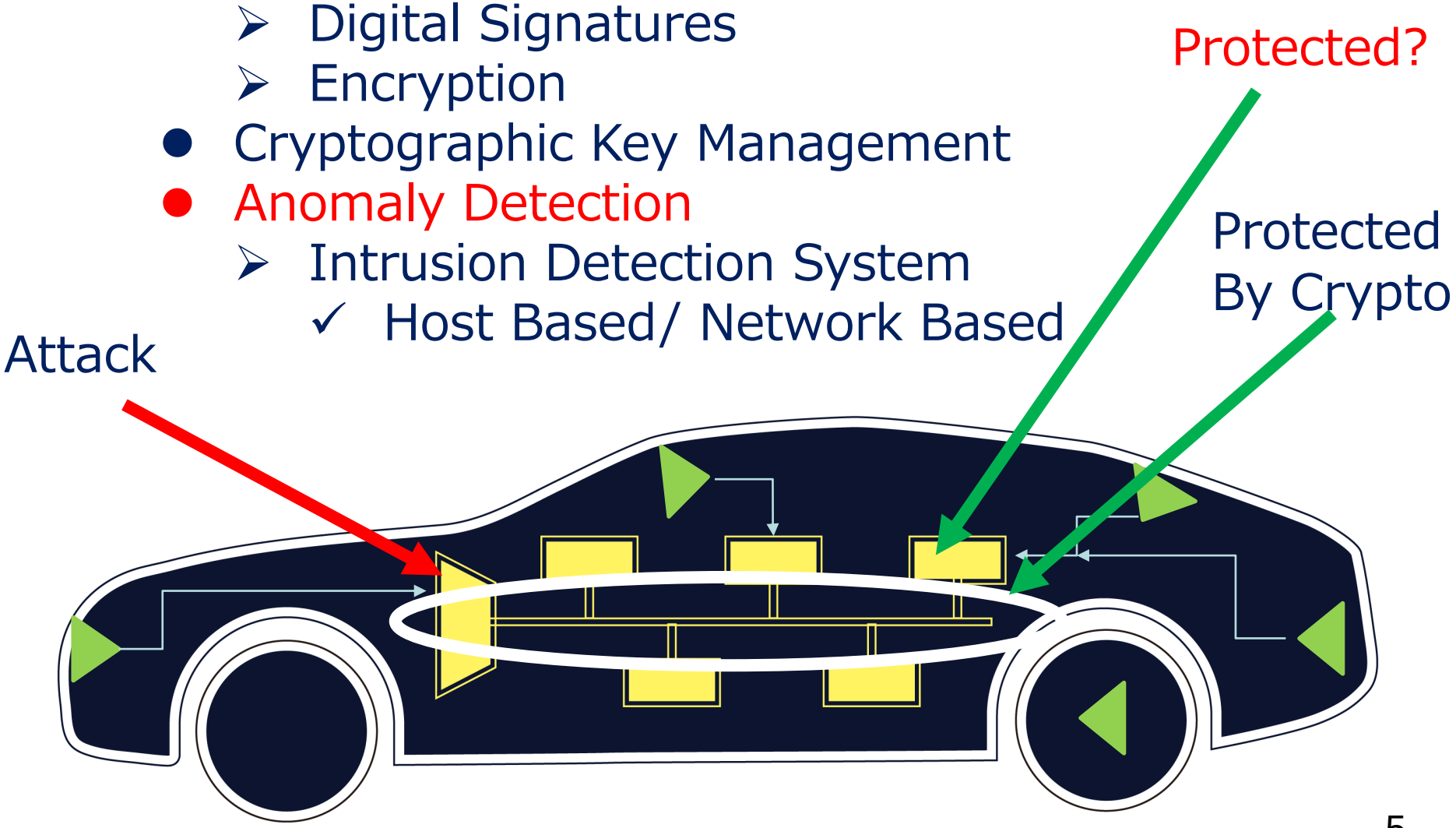
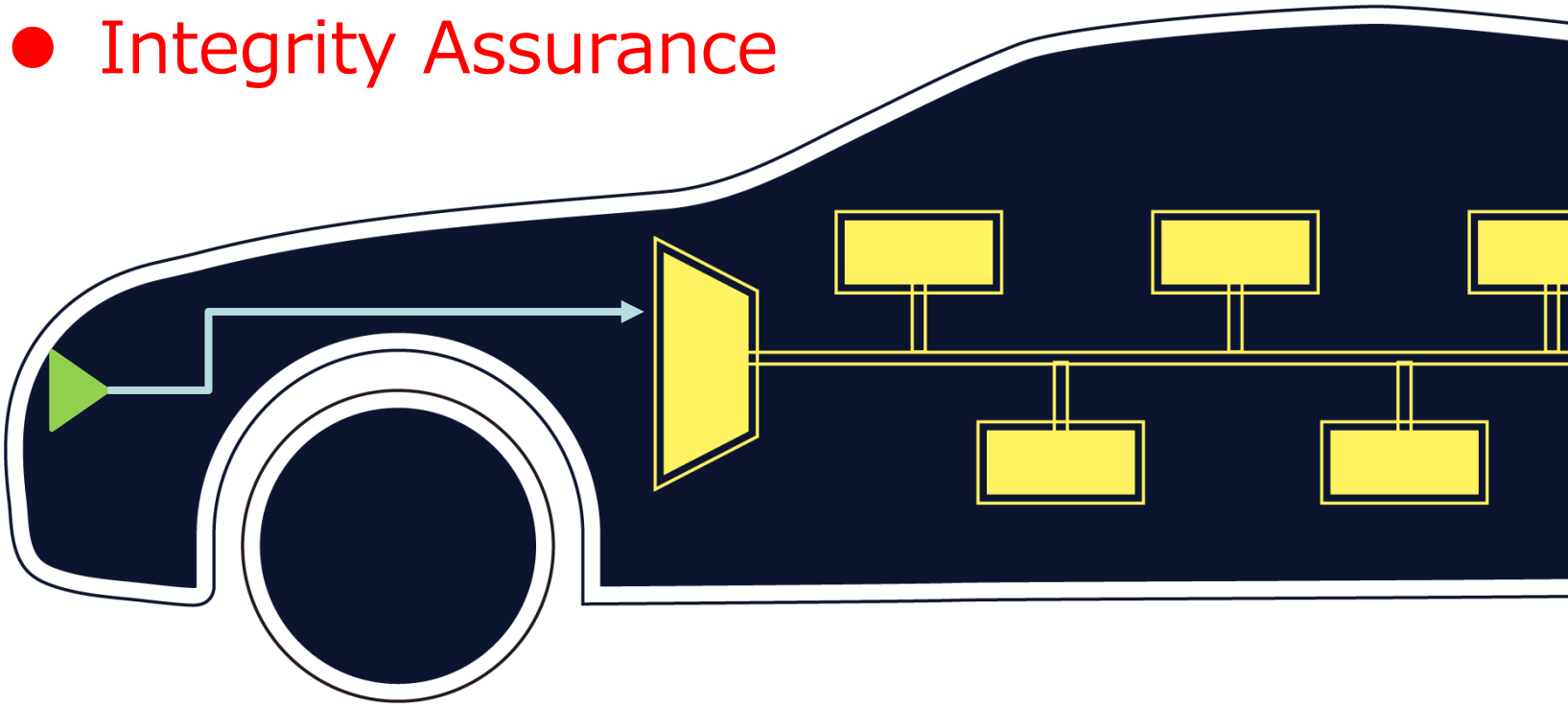


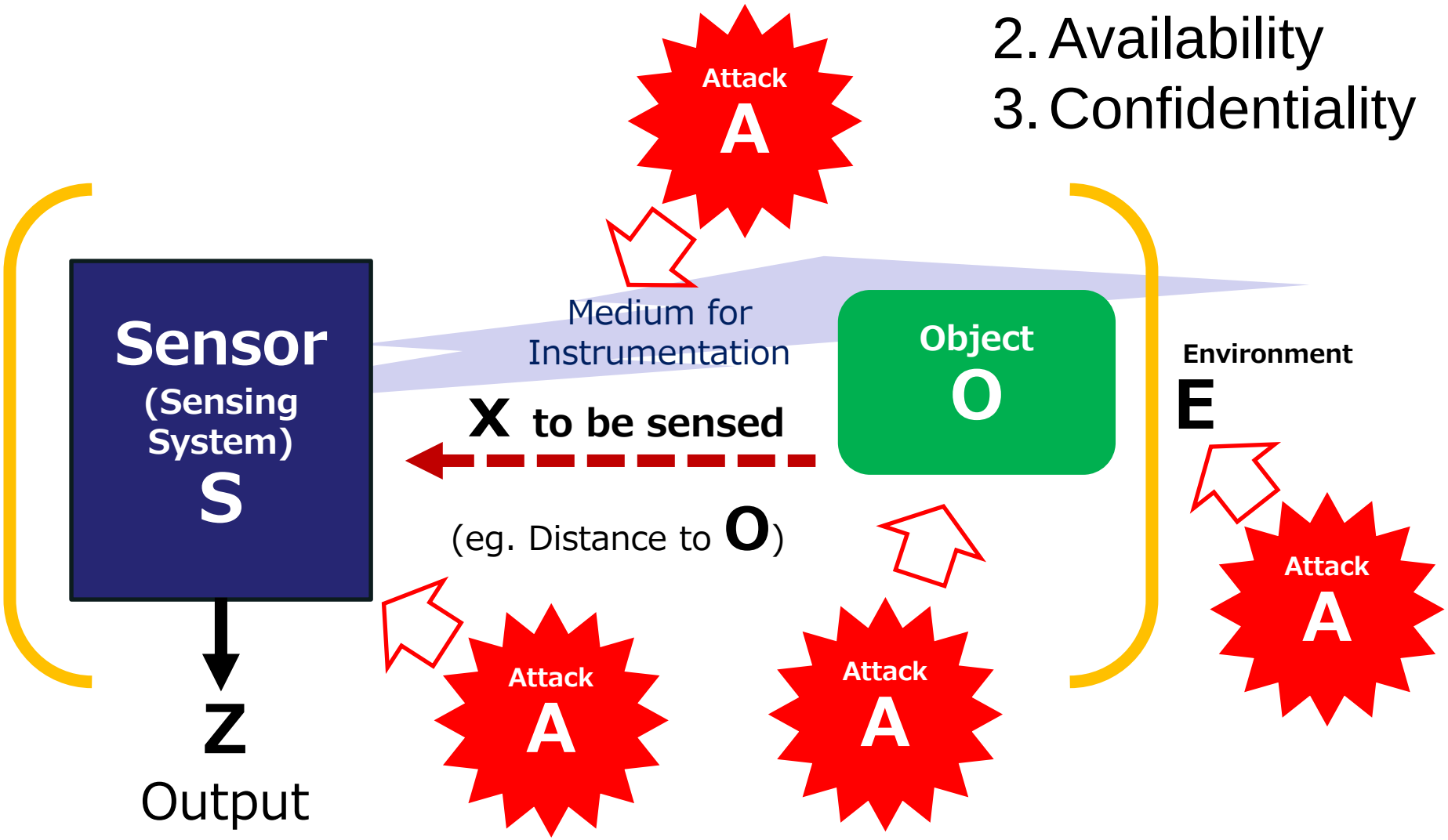
Automatic Driving

- Control Mechanisms
  - Algorithms
  - Data
- Integrity Assurance



Threats to Instrumentation

Attack to
1. Integrity
2. Availability
3. Confidentiality



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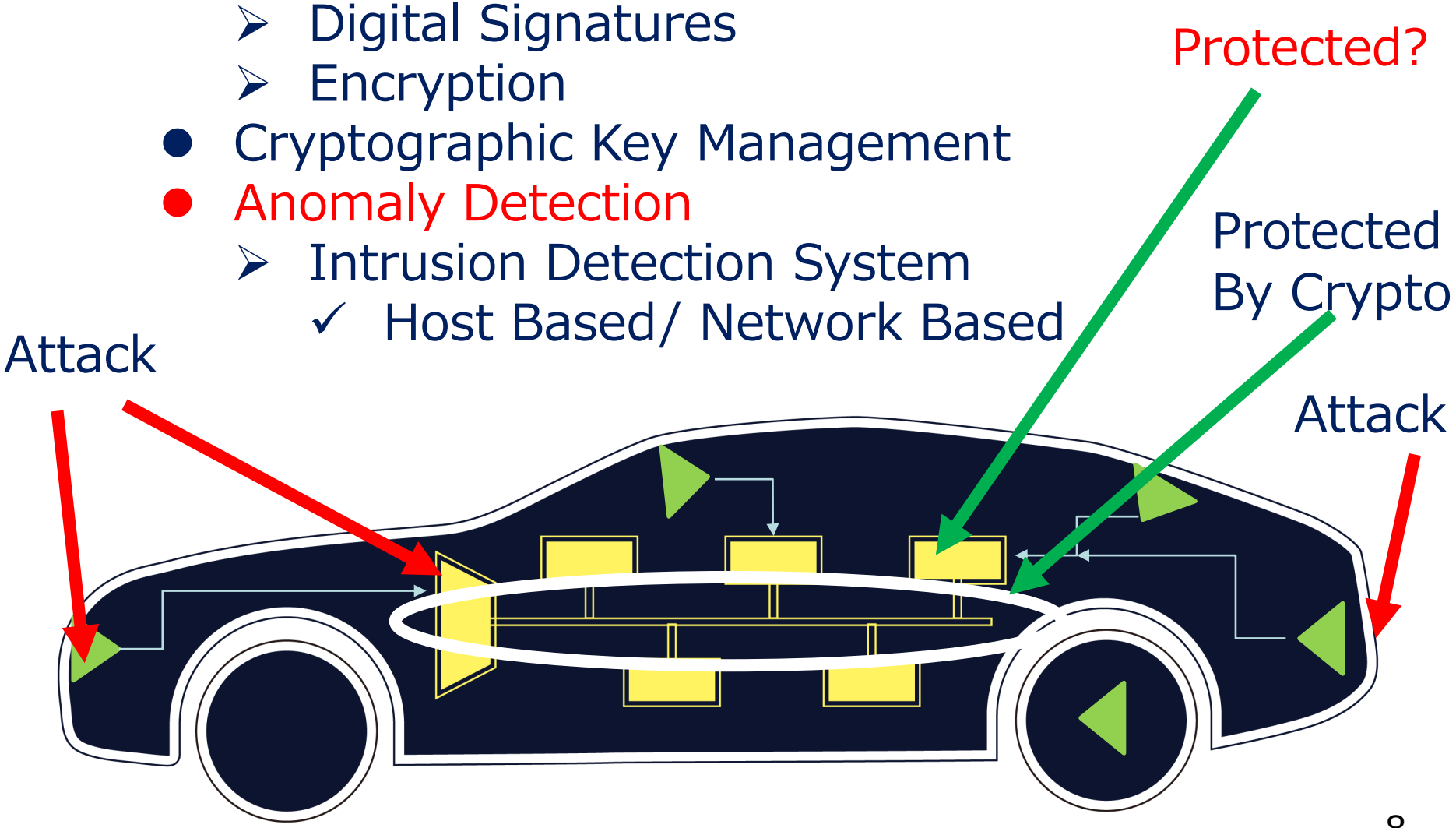
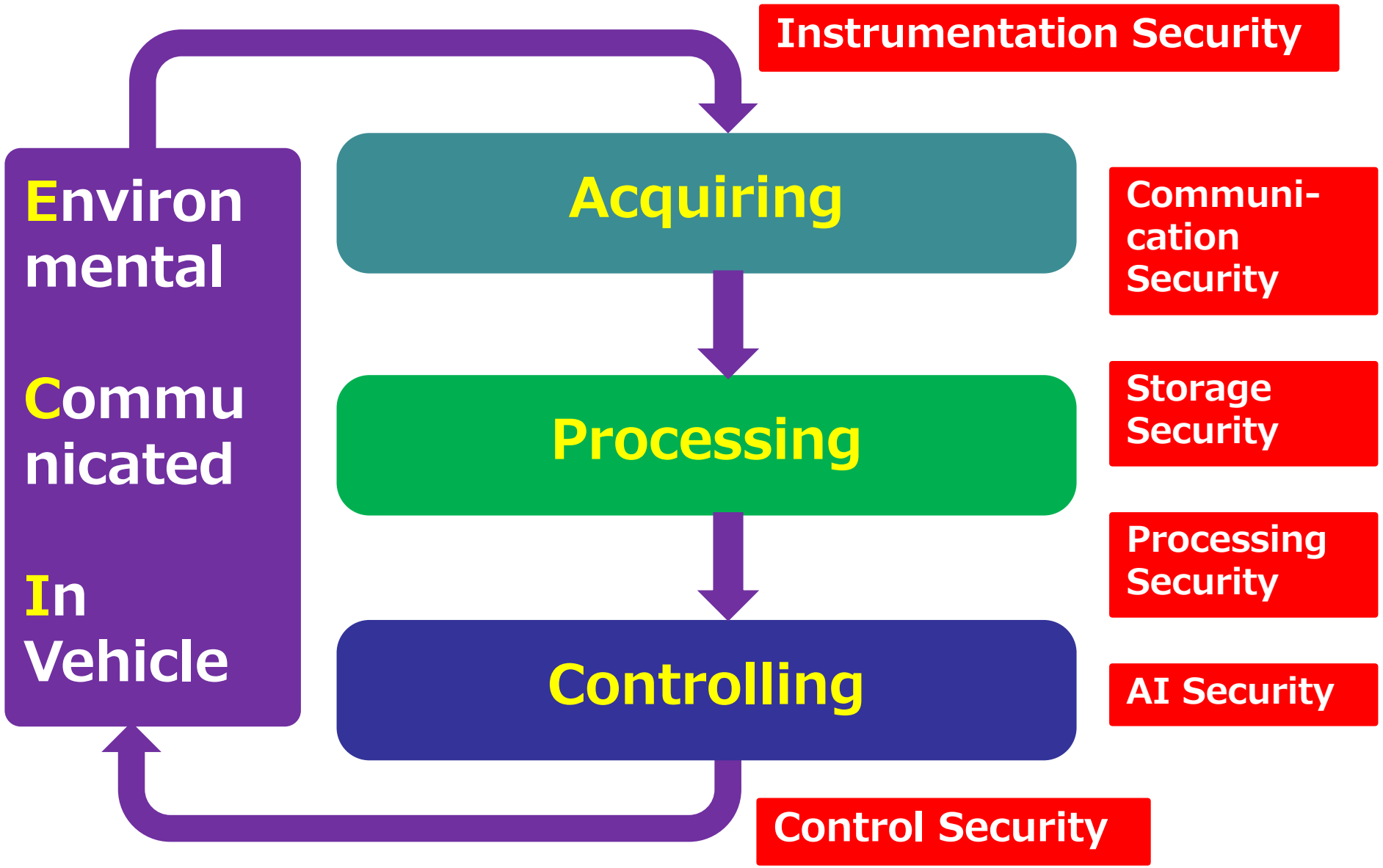
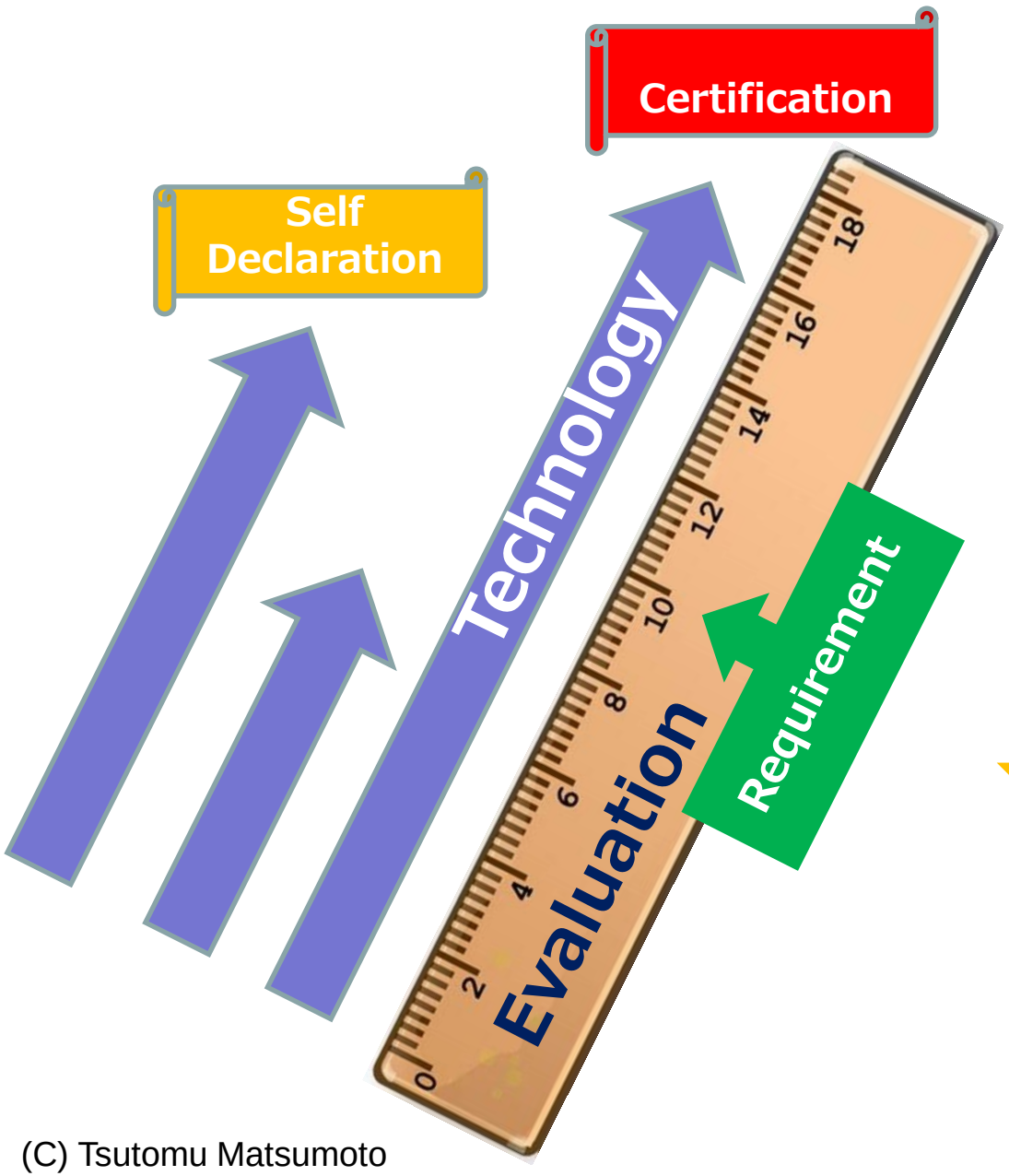


Major Automotive Cyber Physical Security Issues



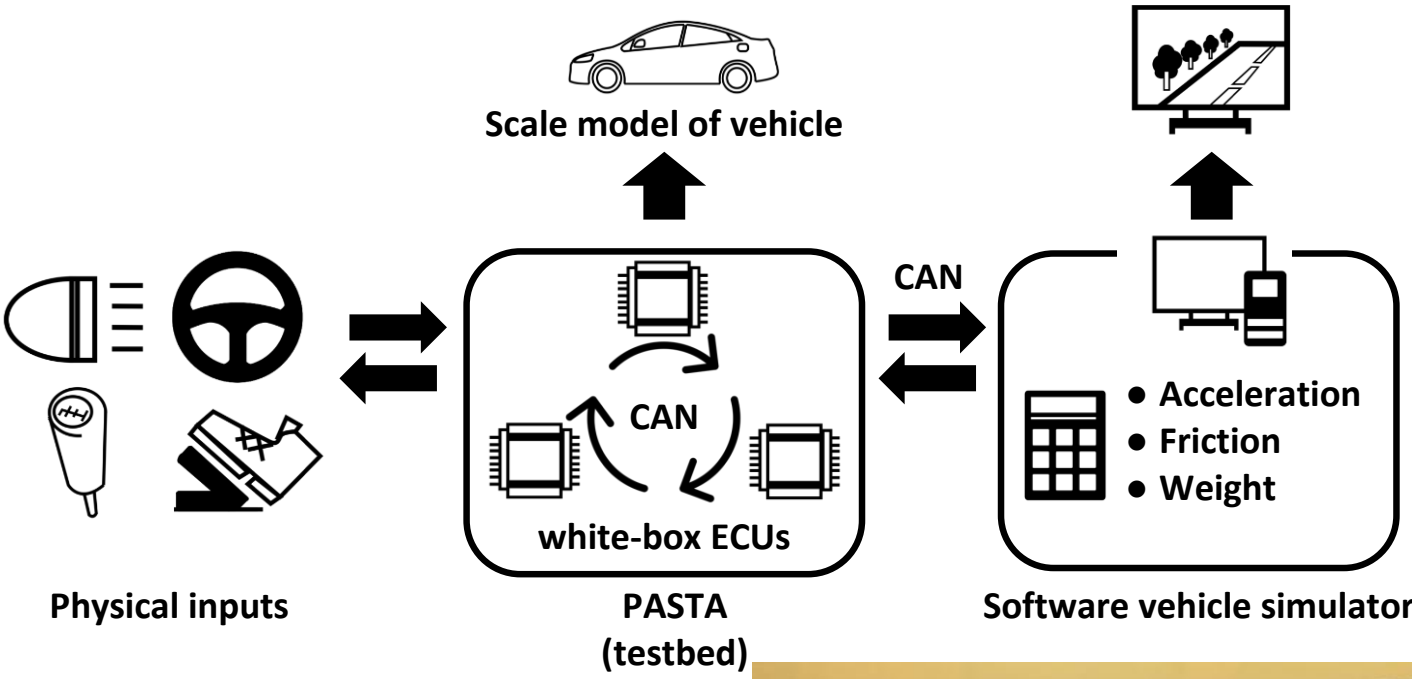
Automotive Cyber Physical Security



Needs for Developing

1. Evaluation Technologies
2. Security Enhancement Technologies
3. Security Assurance Schemes
   - Certification
   - Self Declaration

Superior Automotive Security Testbeds for Responsible Examination and Development of Offence and Defense Technologies



PASTA

A Joint Research by

TOYOTA InfoTech

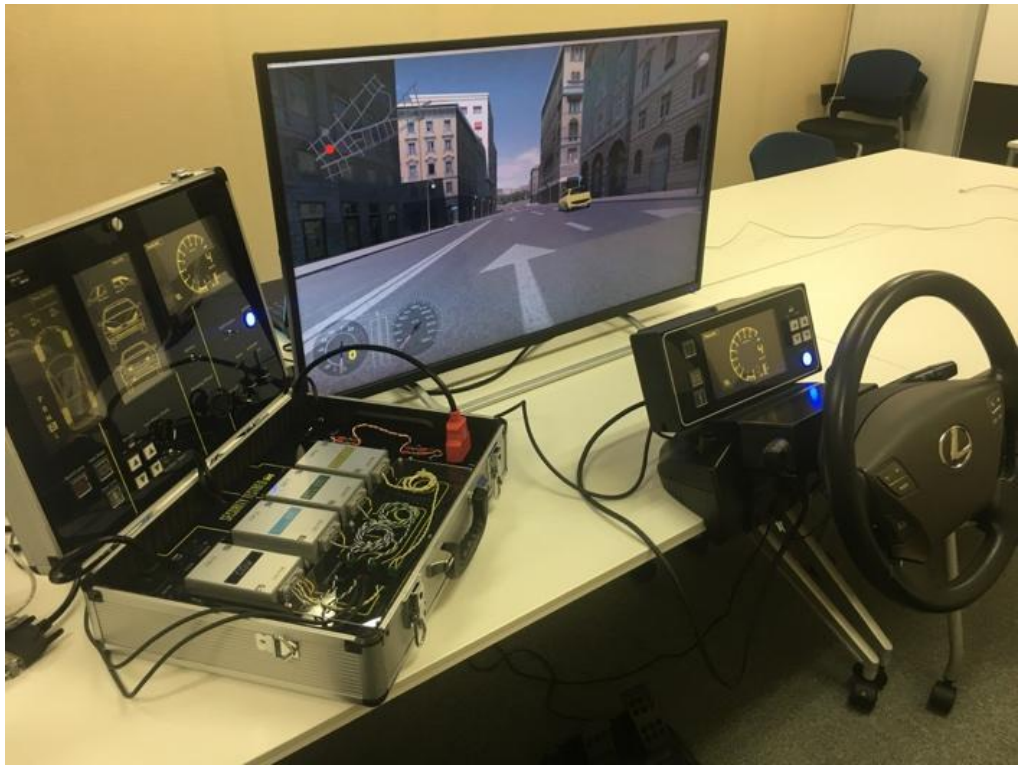
and

YNU YOKOHAMA National University

Details:
Black Hat Europe 2018

Portable Automotive Security Testbed with Adaptability

PASTA in attaché case



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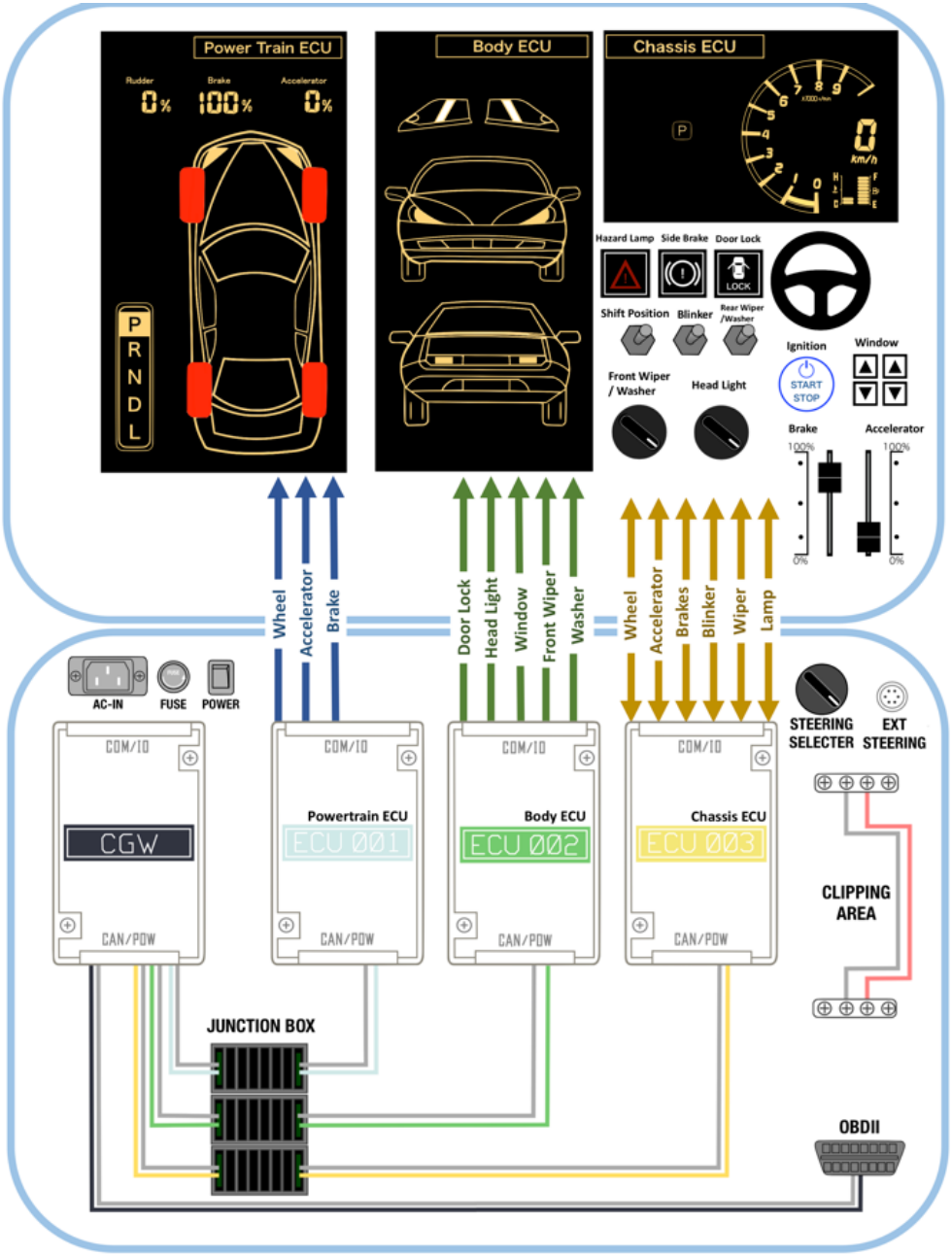
Panels on upper side of PASTA displaying vehicle status

White-box ECUs



Structure of a Version of PASTA

Details:
Black Hat Europe 2018

- Accelerating Security Research by Rich Adaptability and Portability
- Providing Standard Development Platform
- Visualization of CAN Communication Results
- Educational Use
  - Applied to Class “Security Analysis” at YNU

Needs of Appropriate Security Testbeds for IDS/IDPS

Application of Security Testbeds

1. Research
   a. Offensive
   b. Defensive
2. Vulnerability Check
3. Design
4. Development
5. Testing/Verification
6. Education
7. Tester Testing
8. Information Sharing

Thank you!

Tsutomu Matsumoto

URL: http://ipsr.ynu.ac.jp/

YNU YOKOHAMA National University

IAS Institute of Advanced Sciences Yokohama National University