World Standards Day

Technical Report

Artificial Intelligence and Big Data

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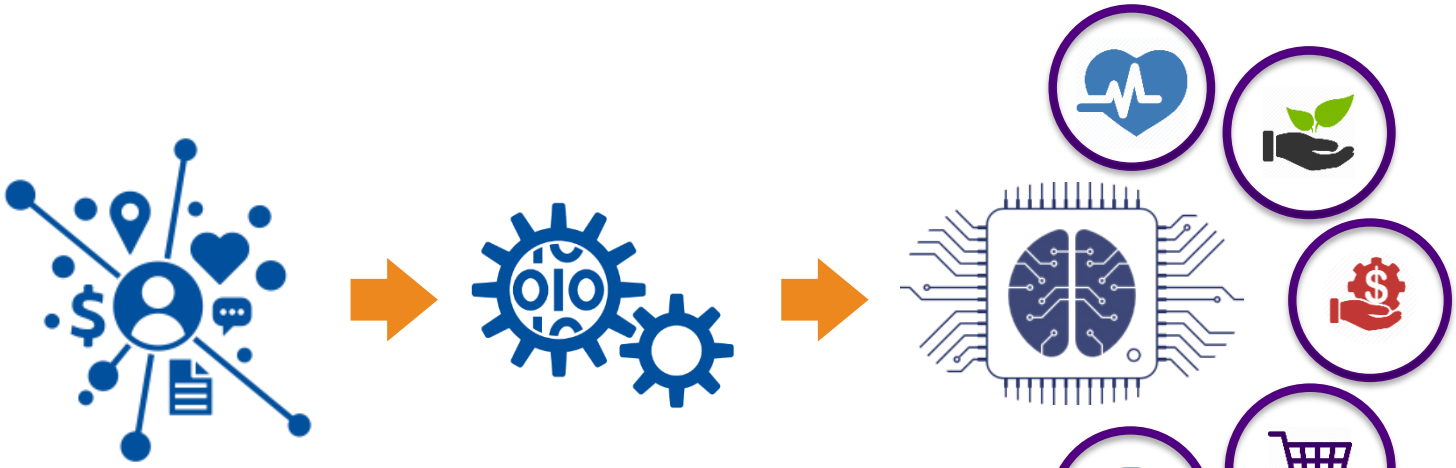
October 2019

Big Data, Machine Learning (ML), and Artificial Intelligence (AI)



Big Data

Volume
Variety
Velocity

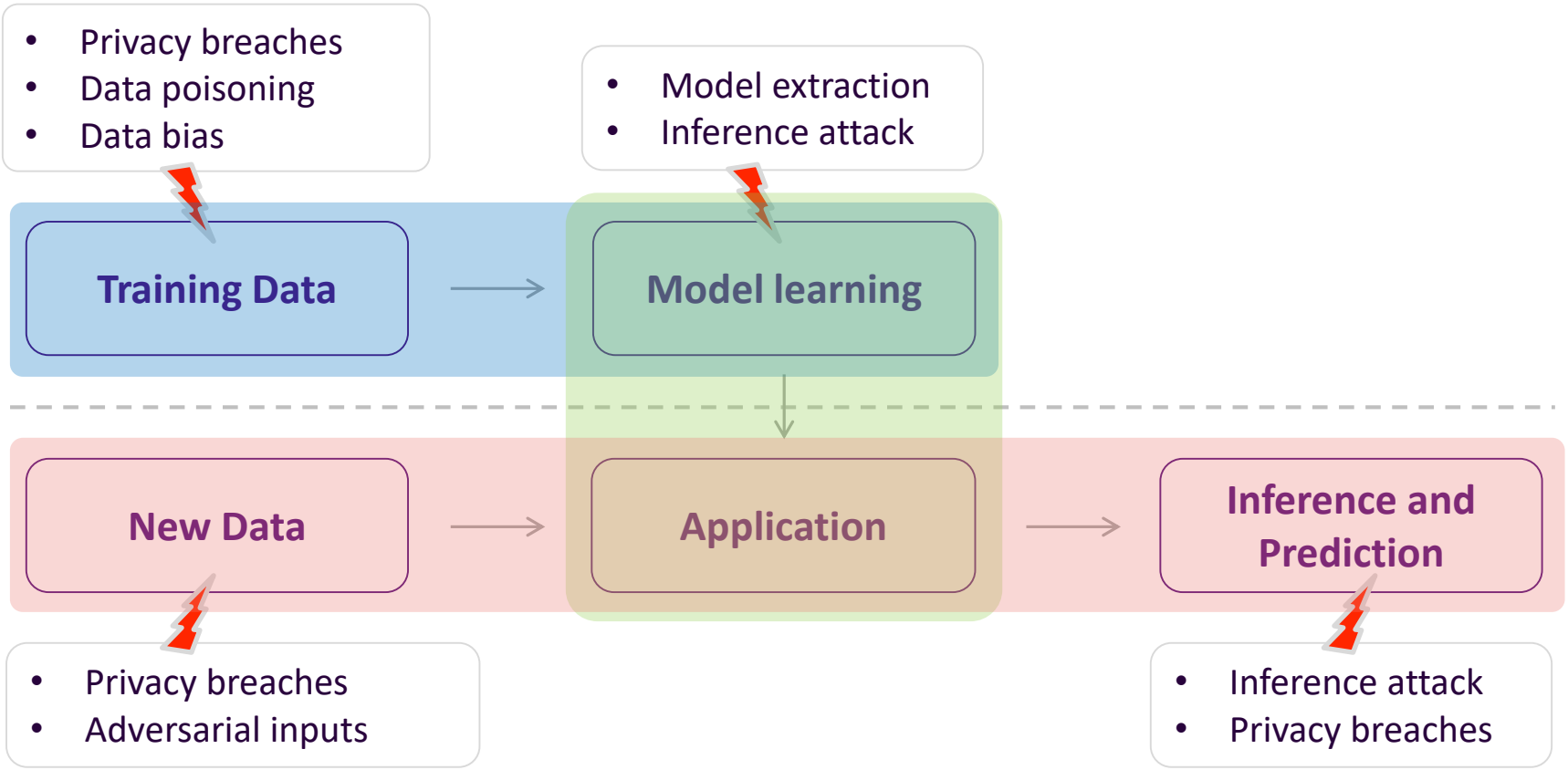
Machine Learning

Supervised
Un-supervised
Reinforcement Learning
Deep Learning

Artificial Intelligence

ILNAS, "White Paper: Data Protection and Privacy in Smart ICT - Scientific Research and Technical standardization", ILNAS, ANEC G.I.E, University of Luxembourg, Tech. Rep., 2018.

Data Privacy and Trustworthiness Threats

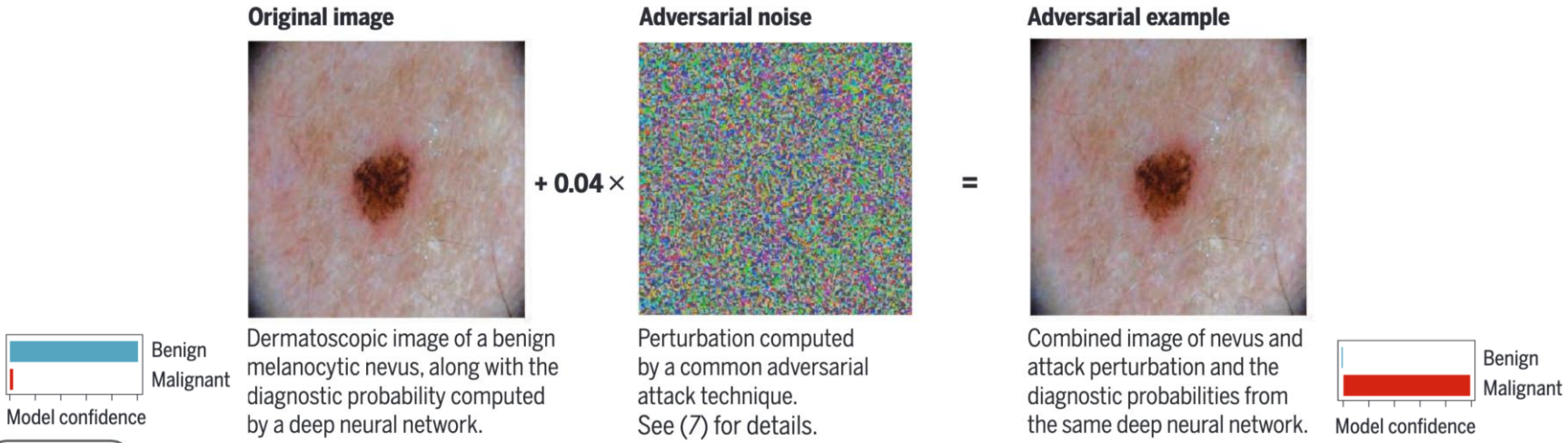


Attack Examples

Recovered image

Training set image

Fredrikson, Matt, Somesh Jha, and Thomas Ristenpart. "Model inversion attacks that exploit confidence information and basic countermeasures." Proceedings of the 22nd ACM SIGSAC Conference on Computer and Communications Security. ACM, 2015.



Finlayson, Samuel G., et al. "Adversarial attacks on medical machine learning." Science 363.6433, 2019.

Importance of Standardization

International *standards*, *certifications*, and *regulations*

- Ensure the degree of privacy, security, and trust against cyber attacks
- Protect individuals' data

ISO IEC ITU cen CENELEC ILNAS

Gap Analysis

Identification

- Definitions and terminology
- Computational approaches
- Applications and use cases
- Privacy and security threats

- ✓ ISO/IEC 2382
- ✓ ISO/IEC WD 22989
- ✓ ISO/NP TR 23347
- ✓ ISO/IEC AWI 24372
- ✓ ISO/NP 3534-5
- ✓ ISO/IEC WD 23053
- ✓ ISO/IEC NP TR 24030
- ✓ ISO/IEC TR 20547-2
- ✓ ISO/IEC PDTR 24028

Gap Analysis

Measurements

- Metrics
- Mitigation Strategies
- Risk quantification

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- ✓ ISO/IEC PDTR 24028
- ✓ ISO/IEC PDTR 24028
- ✓ ISO/IEC NP TR 24027
- ✓ ISO/IEC NP TR 24029-1
- ✓ ISO/IEC 20889
- ✓ ISO/IEC TR 27103
- ✓ ISO/IEC 18033-6

Gap Analysis

Implementation

- Tests and Evaluation
- Constraints
- Implementation

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- ✓ ISO/IEC CD 20547-4
- ✓ ISO/IEC NP TR 24027
- ✓ ISO/IEC NP TR 24029-1
- ✓ ISO/IEC CD 20547-4

Thank You!

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