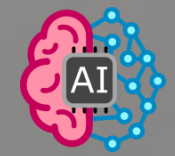
theNetworking Channel

Panel Discussion, May 19th 2021

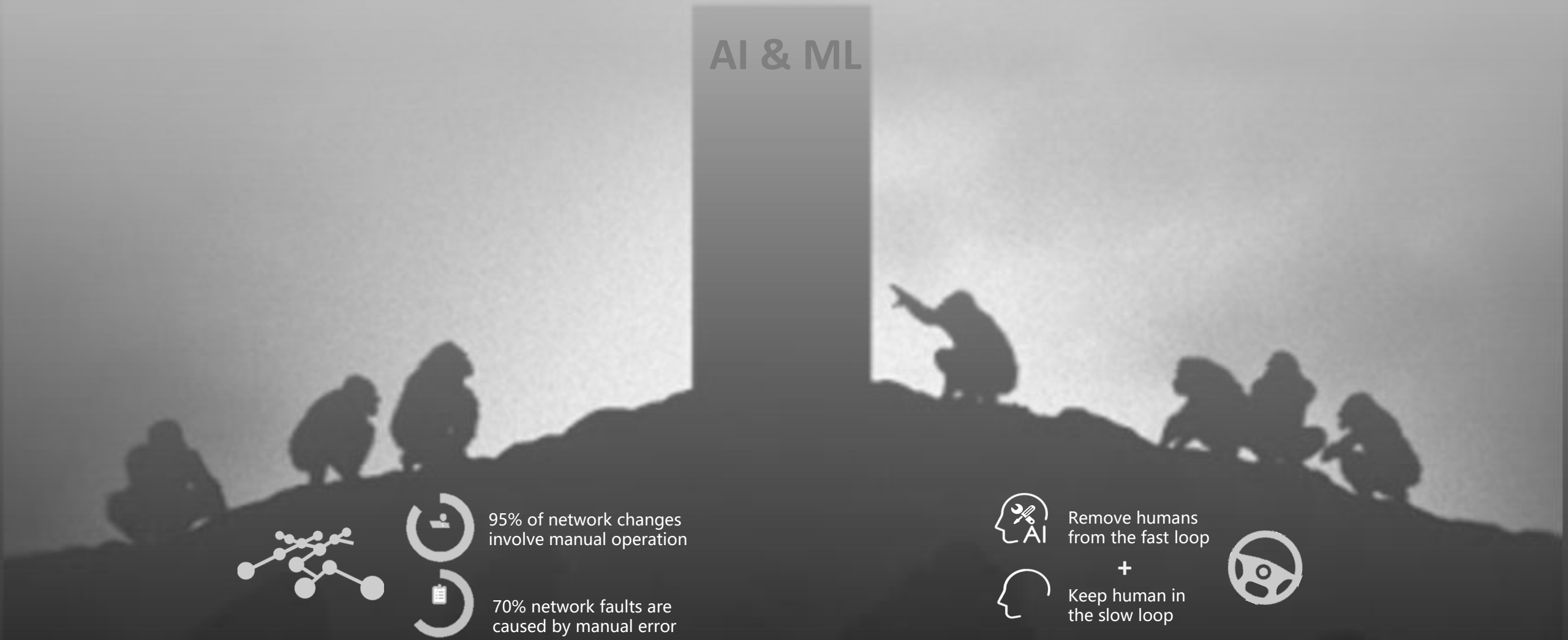
Emerging Trends in AI/ML and Implications for Networking Research

Dario Rossi
dario.rossi@huawei.com

Huawei, Network AI CTO
Director, DataCom Lab, Paris Research Center



Autonomous driving network



95% of network changes involve manual operation

70% network faults are caused by manual error

Remove humans from the fast loop

+

Keep human in the slow loop

∞ Industry segments & requirements

High reliability | **Differentiated services** | **Zero packet loss** | **Smart O&M** | **Real-time, high bandwidth**

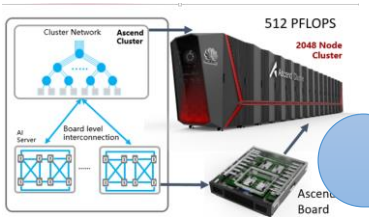
Transportation | Government | Healthcare | Energy | Education | Manufacturing | Mining | Finance

3 Network scenarios

Campus network | DCN | WAN | + | Security

1 Technology solution

Network AI in Huawei



GPUs, TPUs
Ascend910

NAIE
Offline training

Cloud platform
OSS/Third-party app

Northbound
API

NCE
Controller
&
Analyzer

Cross-vendor
southbound API

NETCONF/YANG
Model-driven telemetry

Huawei devices

Vendor B's devices

AirEngine ***NetEngine*** ***CloudEngine*** ***HiSecEngine***

TPU Ascend310,
ARM

iMaster NAIE
Training, data aggregation, and model generalization

iMaster NCE
Network-wide analysis, inference & closed-loop optimization

Engines
Measurement, edge inference & real-time decision-making

Opportunity & challenges

Schedulers
AI-aware job schedulers

Training:
Federated Learning

General:
Multi-vendor graph/models, Transfer learn

Specific:
Deep Models Quantization & Distillation

Control:
large-scale, data-driven, explainable deep RL

XAI O&M:
Unsupervised Fault detection, Semi-supervised repair

Deploy:
Cloud vs edge vs fog vs mist …

Real-time:
inference & control

Incremental & continuous learning

Model self-awareness, Self-supervised learning

Keep humans in the slow loop

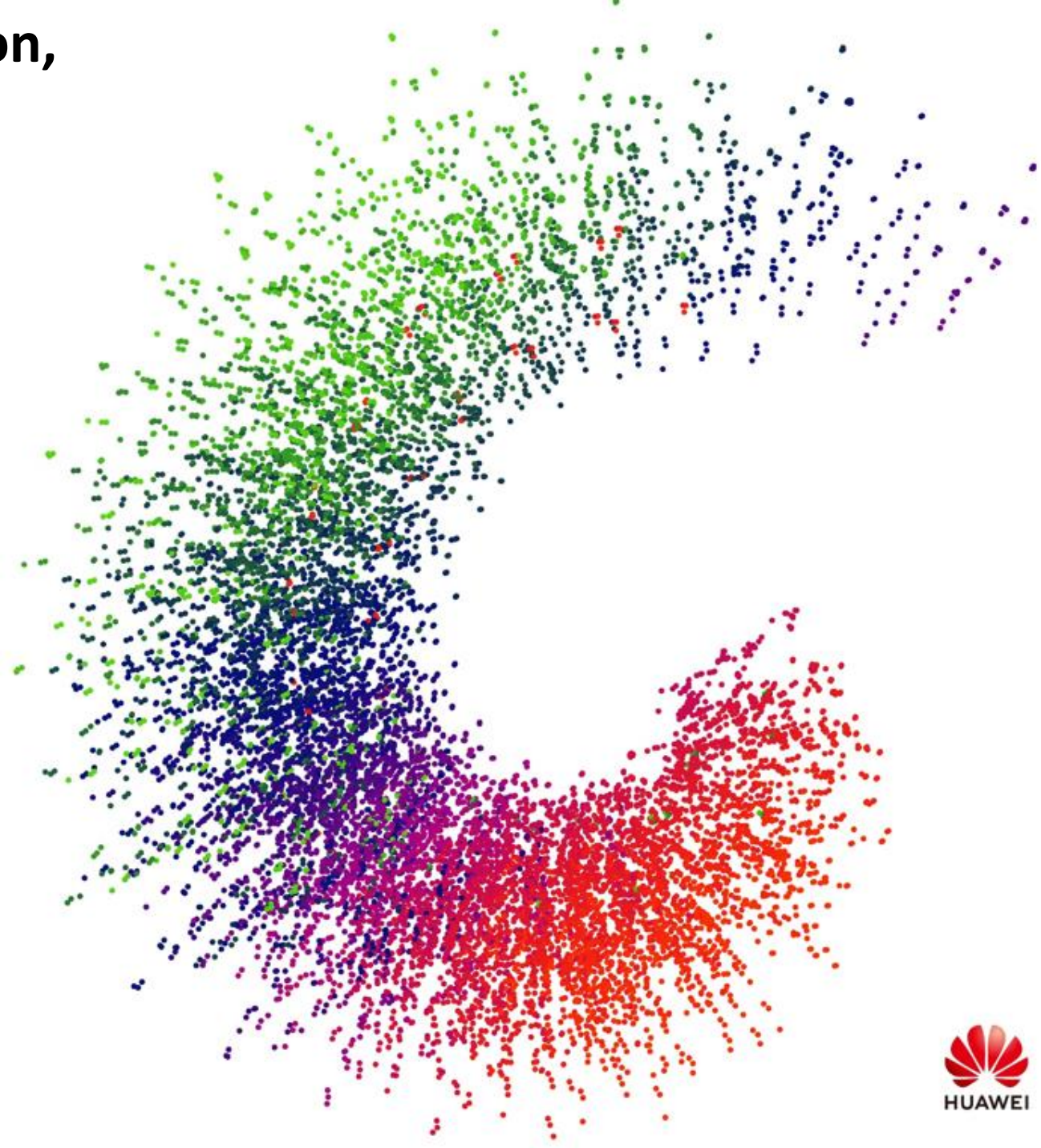
Remove humans from the fast loop

Net 4AI

AI4 Net

theNetworking Channel

Panel Discussion,
May 19th 2021



Thanks

Dario Rossi
dario.rossi@huawei.com

https://nonsns.github.io

HUAWEI