#MWC19

智慧网络论坛
AI in Network Seminar – Powered by Beta Labs

#MWC19

Keynote
主题演讲

Junlan Feng 冯俊兰
Chief Scientist
人工智能首席科学家
China Mobile 中国移动

中国移动
China Mobile

通信网络智能化之路

中国移动研究院 冯俊兰

2019.06

Status

Talk a Lot： Concepts， Possible Applications in Future, 5G for AI，AI for 5G

5G/Telecom Communication Network + AI

Deliver little： Demos, Small Trials, Research Prototypes, Applications Deployed in a limited scale, Use cases

How Far are We?

- State-of-Art AI technologies are evolving fast. It succeeds in many fields, but faces serious challenges on robustness, cost-effectiveness , as well as a general learning capability.

——As a Truth

- 5G is speeding up to be commercially deployed in large scale, but with quite distance from an ideal 5G network at many aspects.

——As a Fact

- Where should they meet ? What AI technologies will be contributing most to Network Intelligence? Can 5G facilitate AI applications to be cost-effective, more robust and large-scale?

——Questions for the Telco industry?

- Are we sincerely working on bridging the gap? Are we on the track to solve the fundamental problems? If not , what way should we action on ?

——Questions for the community?

State-of-Art AI technologies

Phrase-I:
Problems Hard for Human, but relatively straightforward for Machines if the problems can be formally described with symbols and math rules

Phrase-II:
Problems easy for human to perform, but hard for People to formally describe

Phrase-III:
Robustness, Cost-Effective, Reliable, General AI

State-of-Art AI technologies

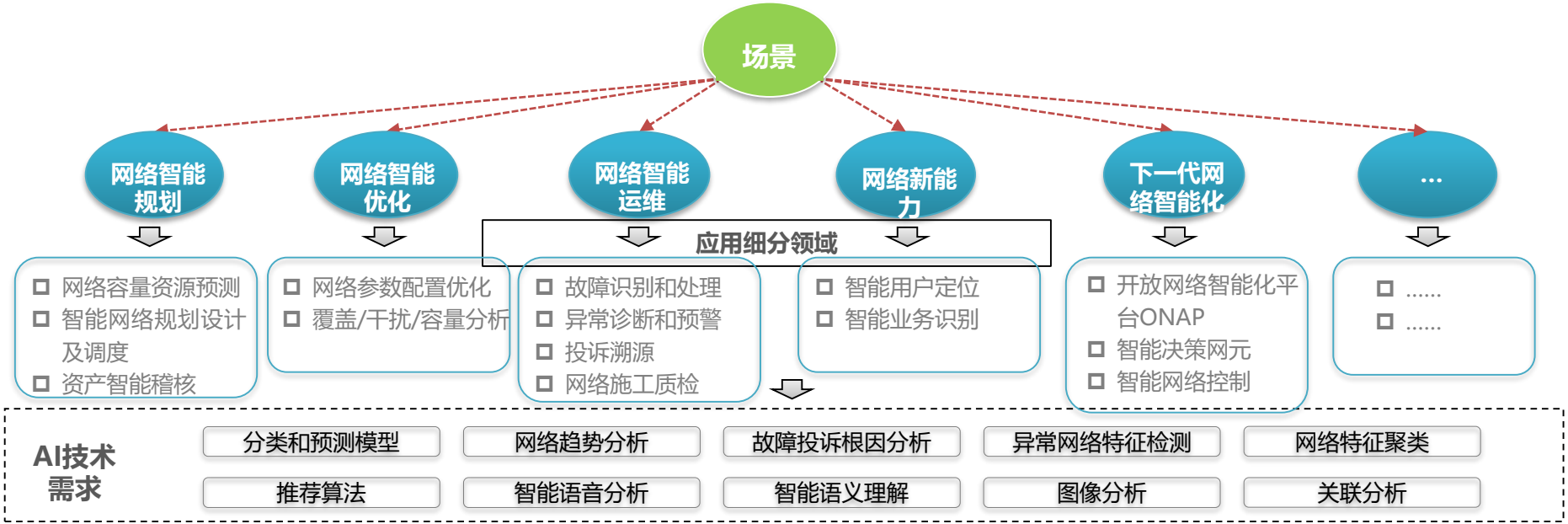
- Multi-dimension Single Data Points
- Time Series Data
- Grids
- Graph
- Dynamic Environment

- Machine Learning
- Deep Learning
- Adversarial Learning
- Reinforcement Learning
- GI: Meta-Learning, Transfer Learning, Multi-Task Learning
- Bayes Learning , PAC-Bayes Learning

- Classification
- Regression
- Prediction
- Generation
- Clustering
- Visualization
- Summarization

AI助力网络，推进网络智能化，增强网络核心竞争力

- AI可用于网络的方方面面， 包括网络规划、设计、优化、运维、新能力提取等，赋能价值大；网络智能化专业性强、行业壁垒高，且整体处于起始推进阶段。



中国移动 China Mobile

聚焦网络、安全、管理、服务和市场五大领域，做大应用规模

网络自服务机器人
客户投诉处理效率提升20倍
研究院、江苏公司

智能VoLTE语音质量评估
语音分析成本降低83%
网络部、研究院、浙江公司

智能家宽装维质检
所需人工降低95%
网络部、杭研

智能客服“移娃”
月峰交互量2.1+亿次
在线公司、研究院

智能覆盖优化系统ACOS
TopN小区覆盖率提升6%
设计院

反欺诈系统
诈骗电话月拦截量1400万+
信安中心

智能稽核
每年可节省上亿成本
IT公司、广东公司、研究院

智能审计
合同、票据等24个审计点
IT公司、苏研、杭研

智慧营销
ARPU环比增加7.5%
市场部、研究院

视频智能剪辑
剪辑效率提升130倍
咪咕公司

Thoughts ： Definition， Systematic， Scale， Cost， Present Network， Future Network

1， Network Intelligence Definition ?

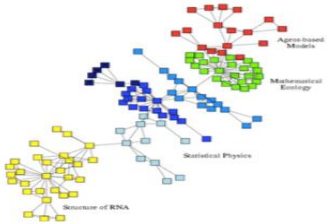
2， Can the efforts be Systematic?

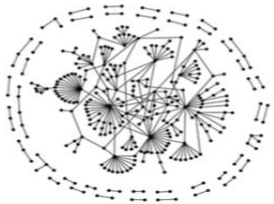
Easy to Hard L1- L5	Service— Operation— Core Functions	Wireless to Core Network	Planning- Construction- Operation- Optimization	Data Sensing Storage- Analytics - Prediction

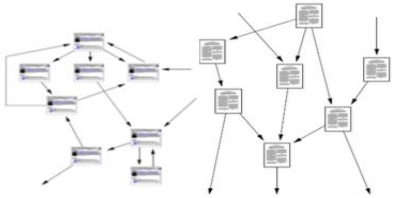
Top Challenge: Can we represent our Network in Math?

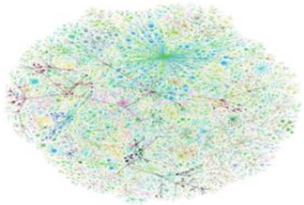
- Multi-dimension Single Data Points
- Time Series Data
- Grids
- Graph
- Dynamic Environment

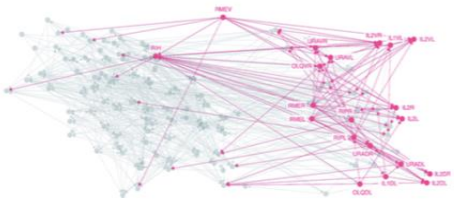

Social networks


Economic networks


Biomedical networks

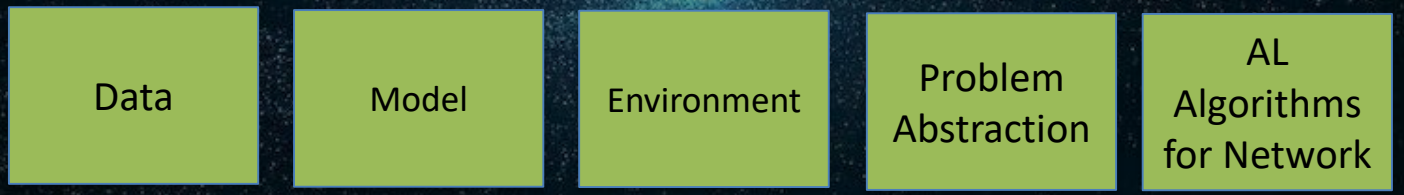

Information networks:
Web & citations


Internet


Networks of neurons

Is it a graph? Way too complex to represent the nodes and edges in Math? How to sense our network?

3， Level of Sharing ?



4， Efficient Way to improve Collaboration Between Industry and Academia ? Is Open Source easier for this integration comparing to commercial software?

5，Methodology or Process to Efficiently Deploy AI Enabled Functions ?

6， Ways of Business Organization to Match Intelligent Network ?

7， Can AI make our Network Simpler ？