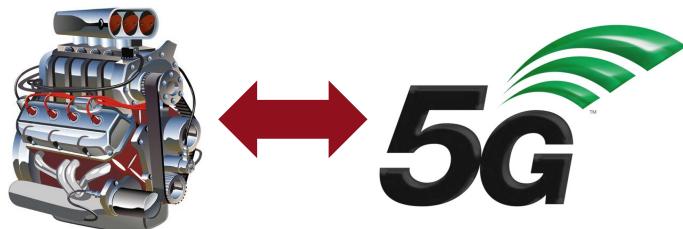


Delivering the Potential of 5G Networks to the End Users

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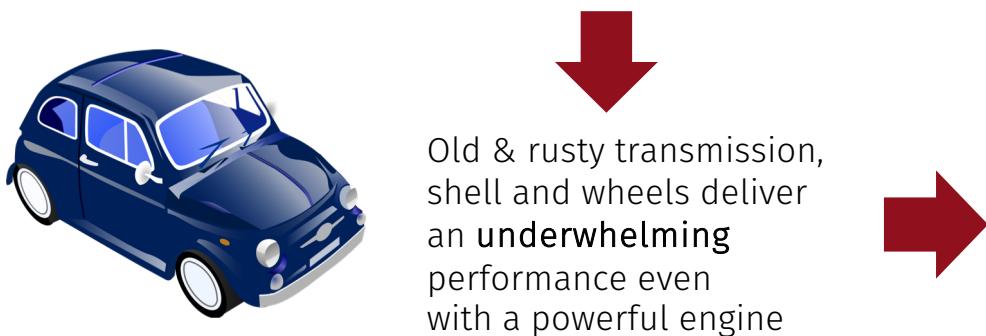
5G is a powerful engine...



5G in a nutshell

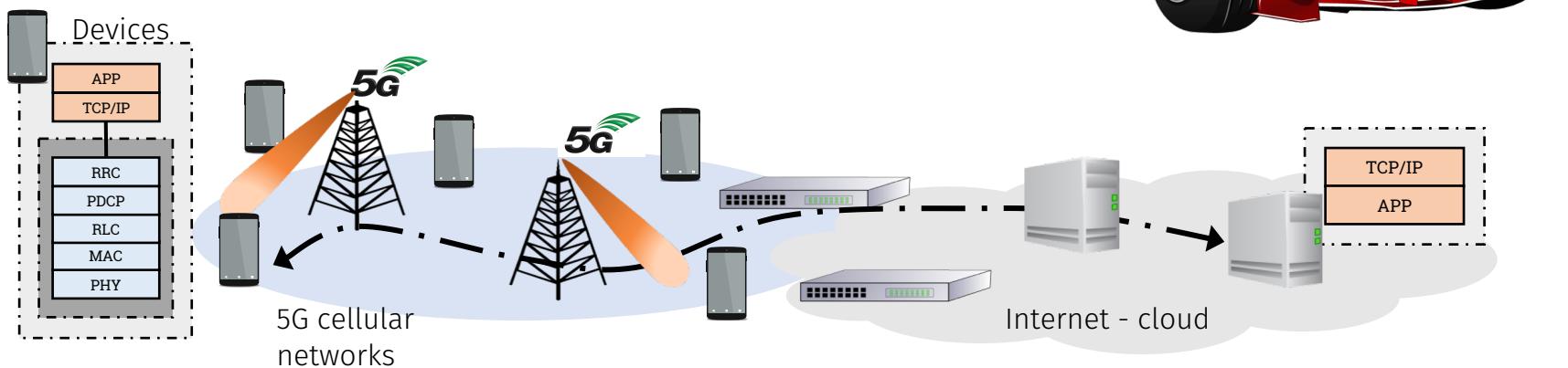
- Next generation of cellular networks
- Market deployment 2019 (USA), maturity 2025-2030
- Enables services worth \$123.27 billion (automotive, VR)
- Ultra-high data rates with mmWaves (up to 20 Gbps)
- Ultra-low latency in the radio access (< 1 ms)

... but the engine is not enough to build a winning race car!



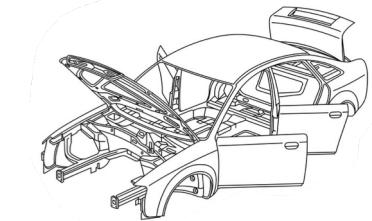
We discovered that **5G severely underperforms** if not properly integrated with the rest of the network

This research project designs networks and algorithms that match the capabilities of 5G



The optimization of complex *end-to-end* networks with *5G base stations* requires a **comprehensive approach**

Architectures



5G mobile networks at mmWave frequencies have high capacity but are unreliable

Protocol used for browsing, video streaming (90% of Internet traffic)



TCP suffers the variability of the 5G mmWave channel: high latency and low rates

Artificial Intelligence



Data-driven network management



Innovative services based on machine learning

