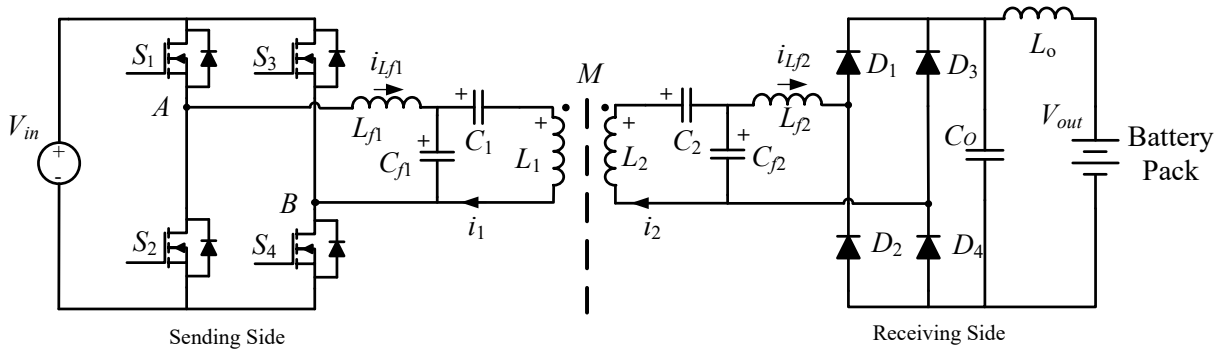
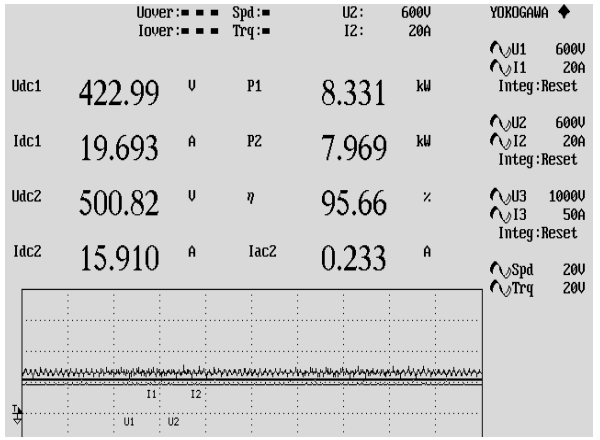
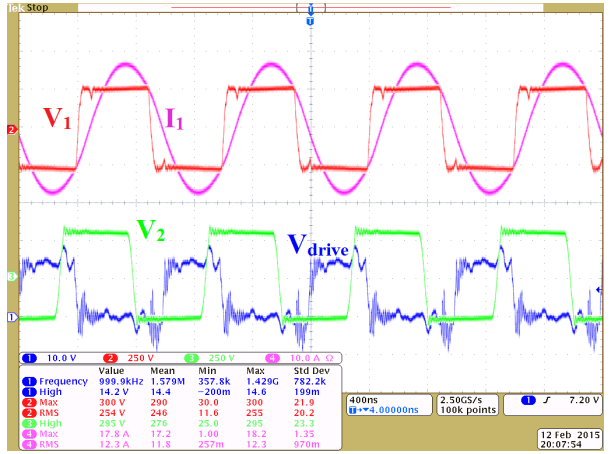
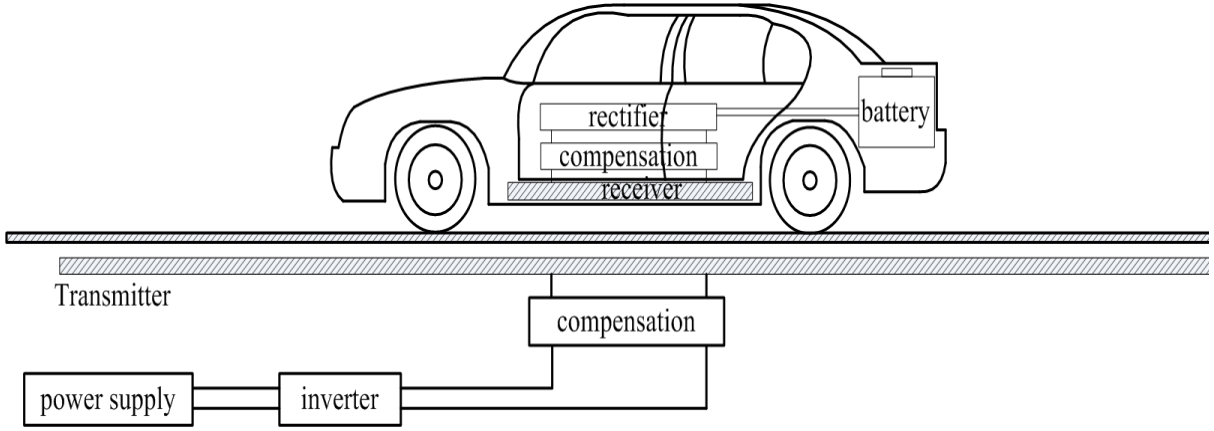
Advanced Topologies for IPT and CPT

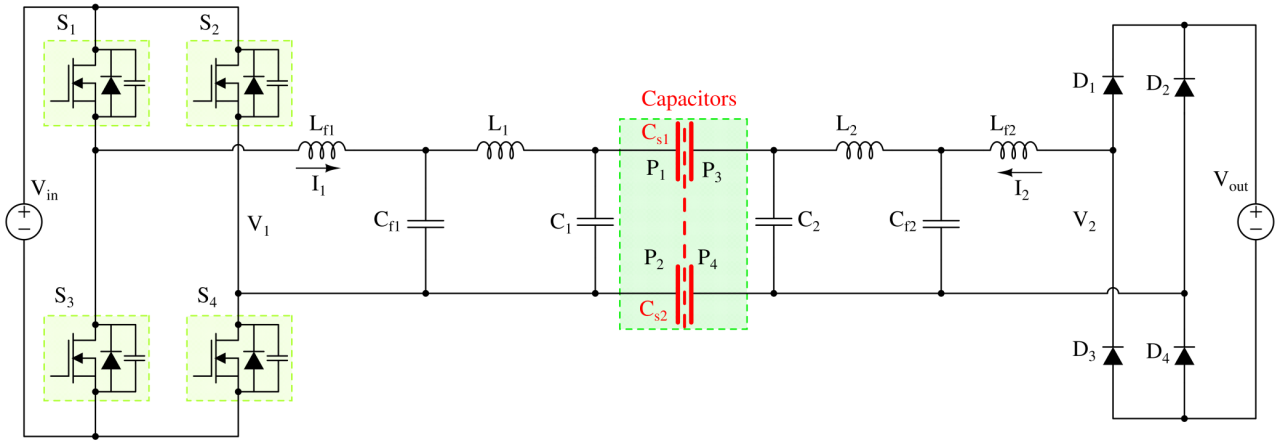
- **Panelist: Prof. Chris Mi, Fellow IEEE & SAE, Distinguished Professor, Dept. of Electrical and Computer Engineering**





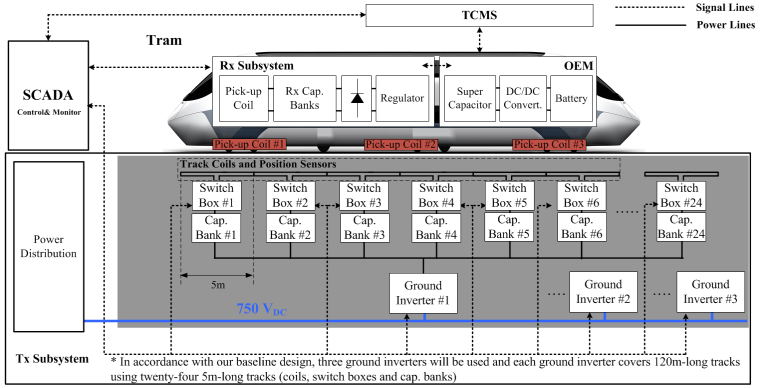


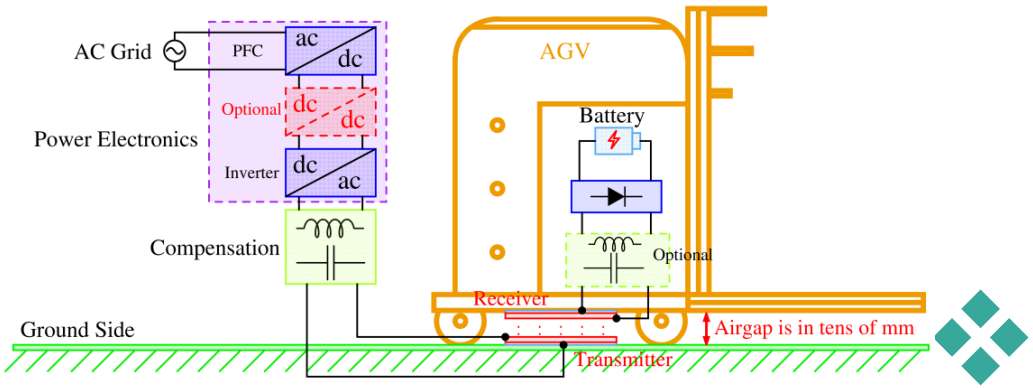




Quasi-dynaic Charging Will be First

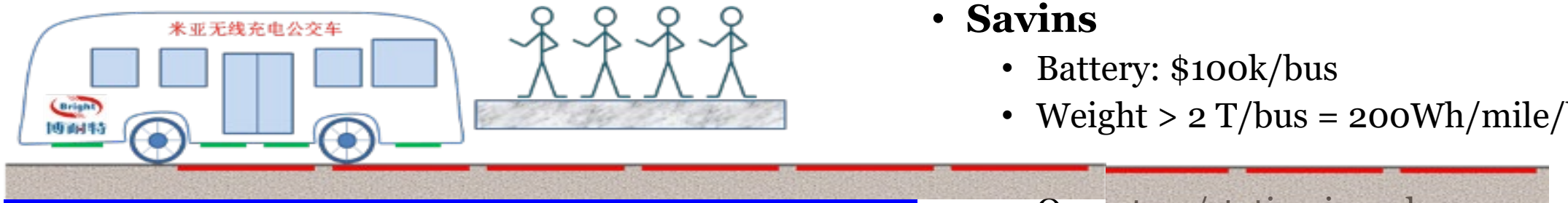
- **Are we going to have roads that are fully equipped with wireless charging capability?**
  - Absolutely not since it is cost prohibitive
- **But it does not mean dynamic charging is dead**
- **Special application and use cases still exists**
  - Factory automation – guided automatic vehicles inside factories and warehouses
  - Port good movement, Electric buses
- **Autonomous driving will further aid to wireless charging**





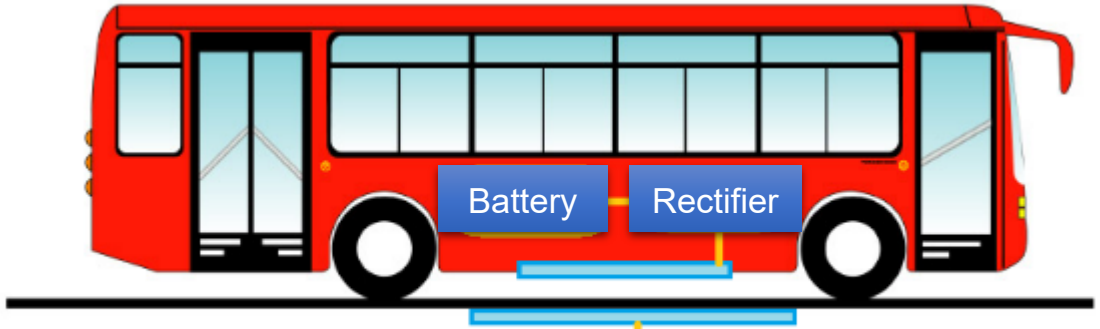
Investment, power requirement, maintenance, safety (foreign object)

Electric Bus Charging: Case Study



Drive in 10 s; stop 20s; drive out 10s, Total charging time: 30s

Total energy Charged: 30s/3600s * 240kW = 2kWh → 2 miles



Power from Grid:
Rectifier+PFC+DC/DC+Inverter

- **Savins**
  - Battery: $100k/bus
  - Weight > 2 T/bus = 200Wh/mile/bus
  - Operators/station is no longer needed: $200k/year
- **No need of new land for charge station installations**
- **Increase battery life due to narrow SOC band is used**
- **Eliminate plug, eliminate spark, eliminate electric shock**
- **Less maintenance: no tear and wear of cable, plug,**