The World of Bits, Pixels and Sensors

Presented by Dr. Aloknath De
Senior Vice President, CTO- Samsung India (SRI-B)

27 OCT 2017
Marvelous Contributions of MIPI Alliance
What can you do with 5G?

- **2 Mbps** Video conferencing
- **5 to 25 Mbps** Two-way telepresence
- **10 to 50 Mbps** Current-gen 360° video (30/ FPS, HDR, stereoscopic)
- **200 to 1000 Mbps** 6DoF video or Point Cloud
- **50 to 200 Mbps** Next-gen 360° video

Enhanced Mobile Broadband

- Gigabytes in a second
- 3D Video, UHD Screens
- Work and Play in the Cloud
- Augmented Reality
- Industry Automation
- Mission critical application
- Self Driving Car

Future IMT

- Gigabit speeds
- Massive machine type communications
- Ultra-reliable and low latency communications

Cloud

- Remote Driving
- Remote Healthcare
- Control Center
- Hazardous Work
Disruptive Technologies for Significant Performance Enhancement

- **> 6 GHz System/RFIC/Ant.**
  - Legacy Bands: 700 MHz, 3 GHz
  - New Bands: 18, 27, 30 GHz
  - mmWave RFIC
  - Wide Coverage Antenna

- **New Waveform Design**
  - Filter-Bank Multi-Carrier
  - FQAM

- **Multi-RAT Interworking**
  - 4G eNB
  - WiFi
  - 5G BS

- **< 6 GHz Massive MIMO**
  - Half-Wavelength

- **Advanced D2D**
  - Enhancing Areal Spectral Efficiency

- **Enhanced Flat NW**
  - UE
  - BS
  - Internet
  - Server
5G Connectivity enables Collection, Delivery and Analysis of Live Data

Example: 5G Smart City

One Connectivity Node covers (500m Radius):

- 10 x CCTVs 10 x 24Mbps = 240Mbps
- 1 x Digital Signage 1 x 24Mbps = 24Mbps
- 5 x LTE Smallcells 5 x 240Mbps = 1,200Mbps
- 250 x sensors 250 x 256kbps = 62.5Mbps
- 5 x Public WiFi 5 x 300Mbps = 1,500Mbps

Total 3Gbps
Samsung and KDDI 5G Handover Test

5G Mobility Test at High Speed (200km/h ?)
Augmented Reality
Different types of Camera and Megapixels

Megapixels

Revolution of cameras

Gear 360

2017 © Samsung Electronics. All Rights Reserved. Confidential and Proprietary. 

Courtesy – PhotographyLife & Unifore
Example from MIPI: Visual quality sets bar for compression

MIPI DSI and DSI-2 and VESA DSC compression

ISO/IEC standardized procedure to verify image quality
AR Overview and Applications

Motion Tracking

Environmental Understanding

Light Estimation

AR Overview Blocks: Courtesy – Google ARCore
IoT
- 20 billion IoT enabled devices are available in the market
- Samsung enable 100% IoT ~ 2020
IoT – Smart Home

1. Customized Device Control
   - Integrated Samsung Smart Home Service Platform

2. Home View
   - Get real-time status of the house
   - Via built-in cameras or appliances
   - Home Assistant in a single app

3. Smart Customer Service
   - Get informed about the status of appliances
   - Smart home needs to be cleaned or serviced, and receive assistance in a single app

Master Key
- Good Morning: 5 devices selected
- Good Night: 6 devices selected
- Going Out: 3 devices selected
- Movie Mode: 2 devices selected
- User Created: 5 devices selected

Refrigerator
- Freezer: -18°C
- Fridge: -2°C

Air Conditioner
- Desires: 26°C
- Current: 32°C
- Wash: 01:30

Washer
- Cleaning

Robot Cleaner
- On

AV
- On

2017 © Samsung Electronics. All Rights Reserved. Confidential and Proprietary.
Smart Technologies Will Enable the Vehicle of Tomorrow

The combination of Samsung and HARMAN will empower OEMs to rapidly deploy connected car technologies and services.

IoT – Smart Agriculture

IoT SMART FARM

- Survey Drone
- Weather Station
- Silo Management
- Energy Management
- Irrigation Monitoring
- Earth Condition Monitoring
- Security
- Livestock Monitoring
- Livestock
- Feed Production
- Harvesting
- Livestock
- Central
- Crops
- Storage
- Power
- SMART FARM

FOR MORE INFORMATION VISIT WWW.IOTNX.COM

Courtesy – IoT.nxt
Thank you