# Young Professional Forum

# RPD Challenge

## Ready to Challenge with Your Idea?

**Join RPD (Rapid Prototype Development) Challenge**

**Students, Researchers or anybody are welcome!**

**Bangkok, Thailand**
**27 – 29 AUG 2019**

# Young Professional Forum

| Pre-MGA, Online Webinar on 20th August 2019 | | |
|---|---|---|
| **Online Meeting to discuss about RPD Challenge Preparation for ALL REGISTERED PARTICIPANTS OF YPF** | | |
| ZOOM Link for Online Meeting on 20th AUG 2019, 17:00 Japan Time | | |
| https://zoom.us/j/799473299 | | |
| **In MGA, on 27th August 2019** | | |
| 15h30-16h30 | Special Lecture on Android Raw Data Measurement | @ Sapphire 104 in IMPACT |
| 16h30-17h30 | Final Briefing and Guidance of YPF Program | @ Sapphire 104 in IMPACT |
| **In MGA, on 28th August 2019** | | |
| 09:00-12:00 | UN ESCAP Session | @UN ESCAP |
| 12:00-13:00 | Hands on Field Demonstration on the bus from UN ESCAP to IMPACT Transportation will be provided by UN ESCAP. | @ BUS |
| 13:00-14:00 | Lunch (lunch box will be provided to participants) | @ Sapphire 104 in IMPACT |
| 14h00-18h00 | RPD Challenge Prototype Development in Team | @ Sapphire 104 in IMPACT |
| **In MGA, on 29th August 2019** | | |
| 10h00-11h30 | Presentation of prototype (10min each team) and Evaluation | @ Sapphire 101-103 in IMPACT |

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## Rapid Prototype Development (RPD) Challenge

- Objectives
  - Motivate the participants towards developing a system to address actual problem
  - Develop a prototype for POC (Proof-Of-Concept)
  - Moving towards R2C (Research To Commercialization)

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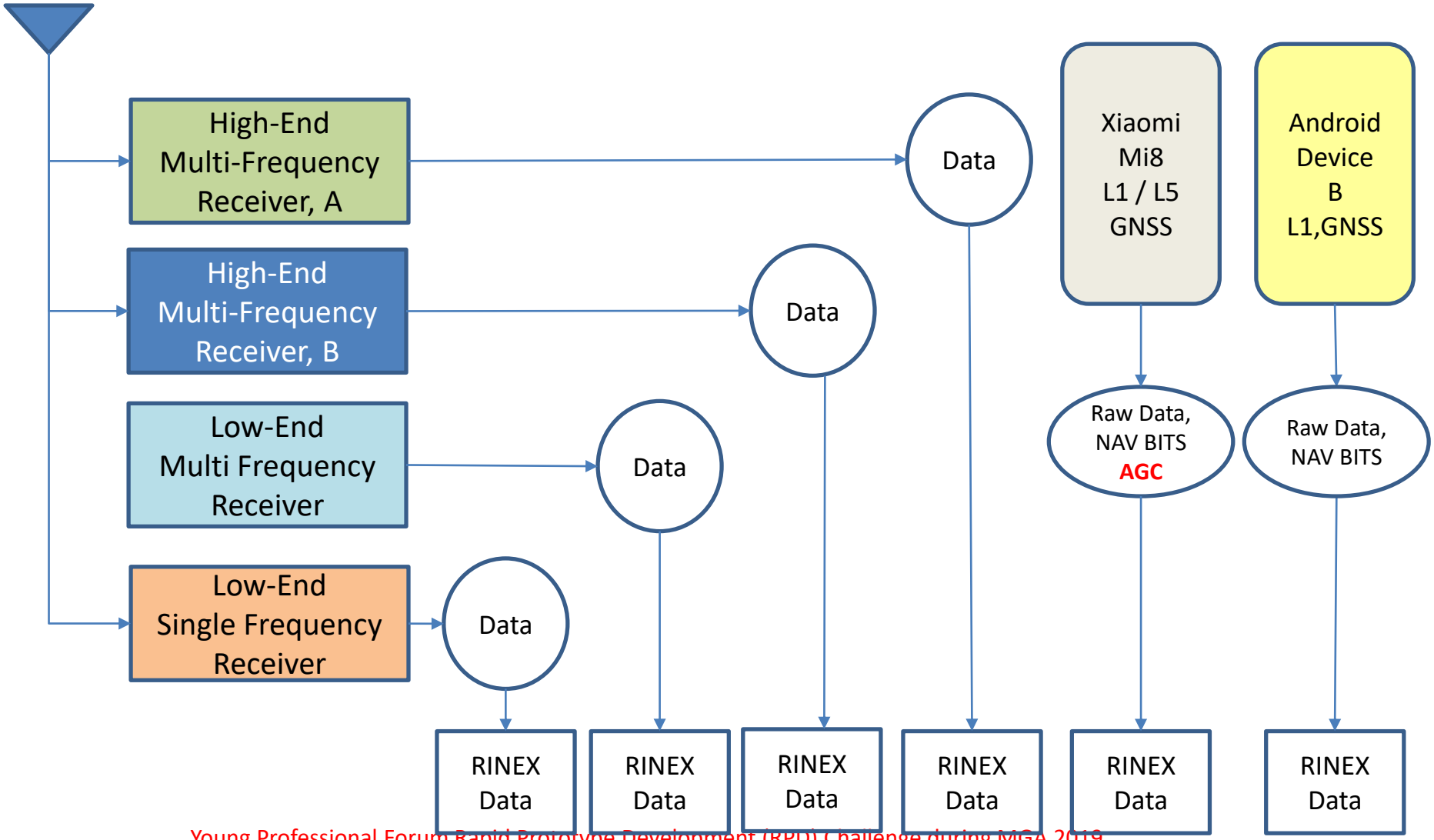
## Rapid Prototype Development (RPD) Challenge

- Methodology
  - Working in Team with mentors
  - Sample GNSS Data, Receivers and Tools will be provided
  - GNSS Data will also be logged using your own mobile phone device
    - Android device only
  - Preparatory Discussions will be held before MGA
    - 20 AUG at 17:00 Japan Time
  - Rapid Prototype Development will be done on 28th AUG, 14:00 – 18:00
  - Presentations will be done on Day 3, AM

# Data Logging Methods



# Device Type and Data Type

| | | Data Type → | | | | | |
|---|---|---|---|---|---|---|---|
| | | Data Type ↓ / Device Type | GNSS Raw Data | L1/L5 Position Data | QZSS L1S Emergency Message | QZSS L6 Correction Data | IF Related Data (Power Spectrum etc) |
| Device or Receiver Type | 1 | Android Device (OS 7.0 or above) | ○ | L1 Only | × | × | × |
| | 2 | Xiomi Mi8 Mobile Phone | ○ | ○ | × | × | × |
| | 3 | MSJ L6 Receiver | MADOCA CLAS | × | × | ○ | × |
| | 4 | U-blox M8T/M8P (L1) | ○ | L1 Only | ▽ L1S MT 43/44 (TBC) | × | NF Values |
| | 5 | U-blox F9 (L1/L5) | ○ | ○ | ▽ | × | NF Values |
| | 6 | Septentrio, M2a or Ax-SB (L1, L2, L5) | ○ | ○ | × | × | ○ |

# Software Tools

| OS | Program Name | Description | Related Device |
|---|---|---|---|
| **Window** | RTKLIB | RTK | Any receiver device with RINEX data |
| **Android** | RTKDroid | RTK in Android | u-blox M8T or M8P connected to android device by OTG cable |
| | SW Maps | GIS Data Input | Android internal GPS, External GPS with BT or direct connection by OTG cable |
| | GNSS Logger | Log GNSS Raw Data in Android Device | Internal GNSS receiver of android device |
| | RTK GEO++ | Log RINEX data from Raw Data | Internal GNSS receiver of android device |
| **Matlab (Windows)** | GNSS Raw Data | Raw Data Analysis | Data logged by GNSS Logger APK |
| | | | |

# Hardware Device

| Device Type | QTY | Responsible | Notes |
|---|---|---|---|
| Signal Generator | 1 | Dinesh | Generate Noise in GNSS bands |
| U-blox M8T Receiver w/Antenna | 10 | Dinesh / Kubo | Single Freq. Receiver for RTK |
| U-blox F9 Receiver w/Antenna | 4 | Dinesh: 2<br>Kubo: 2 | Multi Frequency Receiver for RTK |
| High-End Receiver (TRIMBLE) | 1 | Chula Base-Station | Use as base-station |
| Septentrio Receiver Board M2a or Ax-SB receiver | 1 | Dinesh | To log Noise Spectrum Data / QI data |
| 4-Port Signal Splitter / Combiner | 2 | Dinesh / Kubo | |
| Cables / Accessories / Connectors | 2 sets | Dinesh / Kubo | |
| Computer | | | Bring your own Computers |
| Base-Station Data | | RS/GIS/AIT, CHULA, KMITL | |
| Android Device for Raw data | 4 | Dinesh / Kubo | Xiomi Mi8, Samsung Galaxy |
| | | | |
| | | | |

# Sample Data

| | Data Type | Description | Data Source | Download Link |
|---|---|---|---|---|
| | Base-Station Data | | Dinesh Kubo | |
| | GNSS Raw Data from u-blox | Data logged in Static mode, car, train & air-craft<br><br>Location:<br>Japan, Thailand, Australia, USA, Europe etc | Dinesh | Will be provided later |
| | GNSS Raw Data from Android Device | Data logged in Static mode, car, train & air-craft<br><br>Location: Japan, Thailand, Australia, USA, Europe etc | Dinesh, Kubo | https://home.csis.u-tokyo.ac.jp/~dinesh/GNSS_Raw.htm |

# Recommended Sample Projects

| | Project Name | Project Description | Additional Information |
|---|---|---|---|
| 1 | Low-Cost High-Accuracy Receiver System | Based on Single Frequency RTK data from GNSS Receiver | If you have u-blox M8T or M8P device, please bring it |
| 2 | | Based on Single Frequency RTK data from Android Device | If you have Android device with OS7.0 or higher, please bring to log data |
| 3 | | Based on Dual Frequency RTK data from Xiaomi Mi8 Device | If you have this device, please bring it. |
| 4 | Early Warning System Disaster Information and Resource Management System | Use of GNSS data to broadcast disaster related information and disaster management | Use of QZSS L1S signal<br>Develop APK for Disaster Management and Resource Planning based on LBS |
| 5 | Traffic Data Monitoring | Use low-cost receiver systems to log Traffic Data for Traffic congestion analysis, driver's behavior monitoring, road pricing etc | Sample data from some cities will be provided<br>Please bring some sample data if you have and possible to distribute |
| 6 | ADD your own projects here that you are interested | | List required data, devices and software |
| | | | |

# Base-Station Information

- Host :
- Port :
- Mount point :
- User ID :
- Password :

Details will be provided later

- ITRF2014 coordinates (ECEF XYZ):
- ITRF2014 coordinates (LAT,LON,HGT) - GSR80 ellipsoid:
- Note:

# Teams

| No | Team Members | RPD Title | Brief Description |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |