An Aerial and Ground Monitoring System for Nuclear Accidents

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Operating scenario

Remote station

Indoor

Outdoor

- Fast approach
- Fast deploy
- Fast monitoring

RAM ver 2.0

Operator

UAV

GPS, IMU
Camera, Gimbal
Flight controller
RadMap
Landing gear

UGV

- Power transfer from ATV (1.8kW)
- Long time operation
- Cam + gimbal, sensors
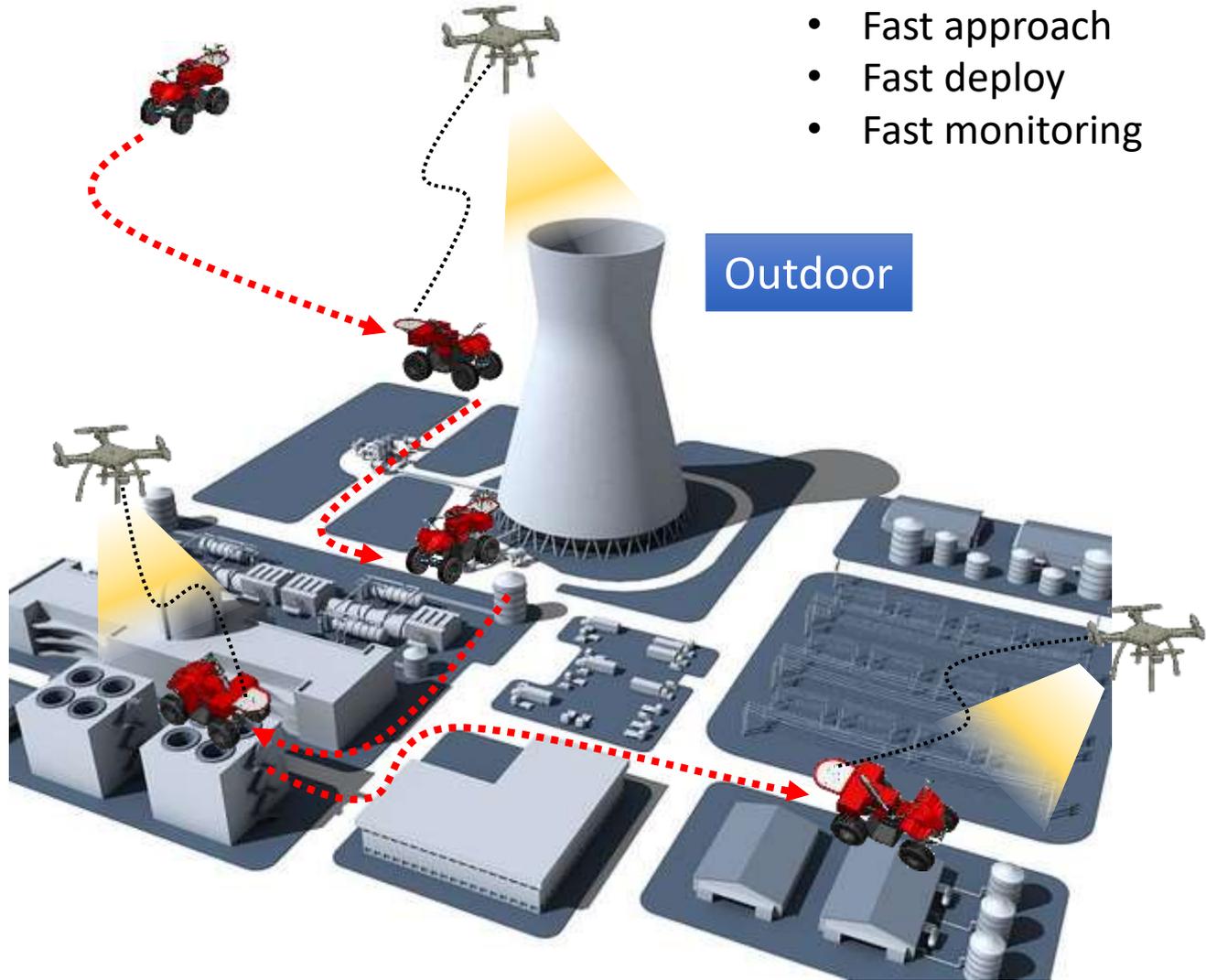
- FPV (Headplay)
  - RF communication
  - 3 Channels (ATV cam x2, Drone cam)
- Joystick controller (Xbox)
- Dual controllers
  - ATV
  - Drone flight + cam

- High speed (60 km/h)
- High mobility
- Engine + generator
- cam

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RAD
(RAdiation Drone)
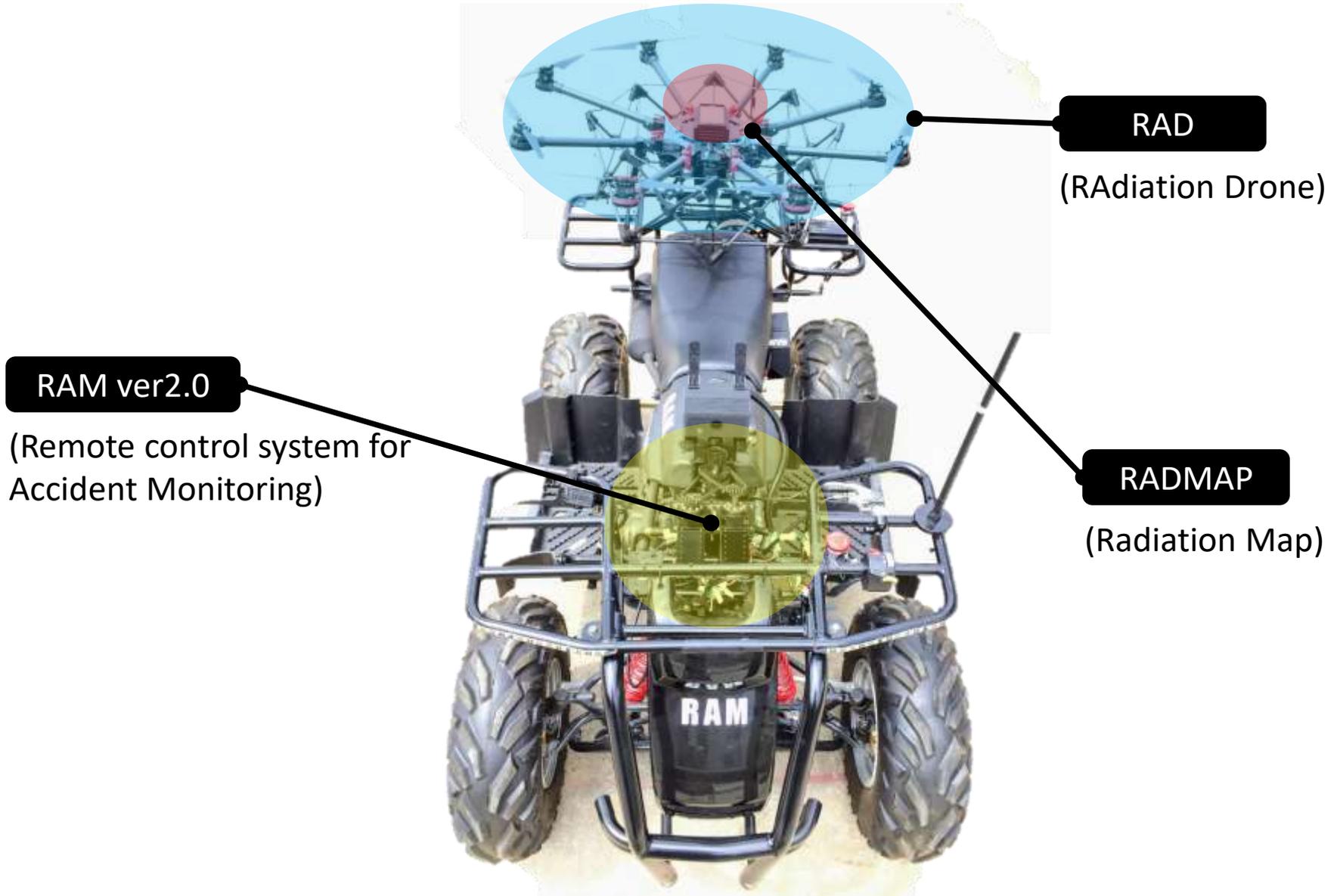
RAM ver2.0
(Remote control system for Accident Monitoring)

RADMAP
(Radiation Map)

RAM (Remote control system for Accident Monitoring)

Item	Specification
L x W x H [mm]	1740 x 1045 x 1110
Max. speed [km/h]	60
Weight [kg]	210
Payload [kg]	160
Operation range (km)	1
Mounting Slope (deg)	30
Battery [V, Ah]	12, 50
Operation time [h]	> 5
Handle bar (payload: 70kg, stroke (-30~30 deg)	0.83 sec/stroke
Throttle (0~100% open)	0.25 sec
Brake (0~100% full brake)	0.35 sec
Brake performance (max. brakable slope) (deg)	33

GoPro, Hero 4
4K video

DJI, lightbridge
Datalink

Headplay
FPV goggle

Xbox controller

RAD (RAdiation Drone)

GPS, IMU

Camera, Gimbal

Flight controller

RadMap

Landing gear

Drone
- S1000+ octocopter
- A3 flight controller
- Zenmuse X3 Gimbal camera
- Lightbridge 2 transmitter

Landing platform

Diagonal Wheelbase	1045mm
Motor Size	41×14mm
Motor max. power	500W x 8
Working Voltage	24 V
Propeller	engineered plastics, 15×5.2inch
Takeoff Weight	6.0Kg ~ 11.0Kg
Hover Power Consumption	1500W (@9.5Kg Takeoff Weight)
Max Power Consumption	4000W
Hover Time	15min (@15000mAh & 9.5Kg Takeoff Weight)
Working Temperature	-10 ˚C ~ +40 ˚C

Take off/landing

RADMAP (Radiation Map)

RadMap (Radiation Map)

Geiger Mueller Detector
- Gamma ray: 50keV ~ 3MeV
- Time to Count method
- GM tube 2EA (halogen quenching)
- Range: 10 uSv/h ~ 100 Sv/h
- (W x D x H) : 90mm x 110mm x 27mm
- Weight: 150g

RadMap
- A5 smartphone
- Android application
- GPS, GM sensor data collect
- Radiation dose map generation

LTE streaming
- Map
- GPS
- Radiation data

RAM ver2.0