# Machine's Environment Recognition and Collision Prevention Safety Control Technology

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⇨ Human–centric machine system safety technology for monitoring surroundings of working machines such as excavator and collision prevention
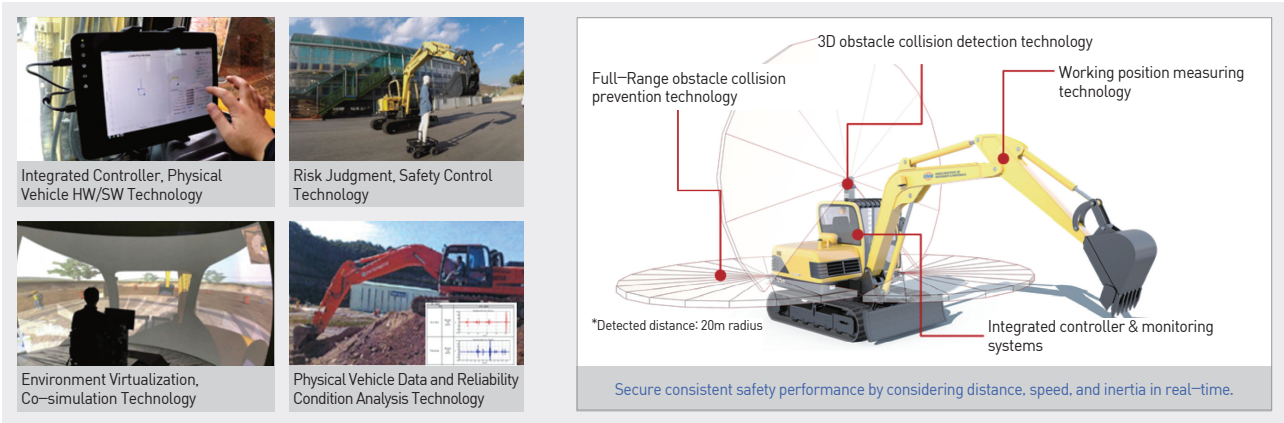
Client / Market

- Construction machinery (excavator, forklift, etc.) manufacturer, operator
- Construction/civil engineering business
- Local government for government–ordered construction

Necessity of this Technology

- An ultrasonic, image sensor cannot predict dynamic behaviors.
- Need to determine the safe time for braking considering dynamic properties of the moving object.
- Active control of emergency stop required, more than a simple alarm
- Can reduce fatal accidents from construction site–high risk group within top 15% of industrial accident
- Crucial core technology for the future considering the trend for machine safety regulation and the speed of unmanned technology advancement

Technical Differentiation

- Developed a LiDAR–based technology with high resolution and precision with existing image and ultrasonic sensor
- Developed a risk judgment algorithm enhanced from the simple distance–based to consider time
- Secured consistent safe distance considering the inertia of excavator's turning movement

**DESIRED PARTNERSHIP** Technology Transfer | Licensing | Joint Research | Other

TECHNOLOGY READINESS LEVEL [TRL]

Excellence of Technology

- Full–Range (360 degree) obstacle monitoring technology
- Simultaneous recognition of multiple objects and algorithm computation within 100ms
- 3D obstacle collision monitoring technology
- Consistent safe distance (1 m±0.25 m) considering the inertia of excavator's turning movement
- Distance–based and time–based collision risk judgment algorithm technology
- Virtualization technology and reliability assessment technology
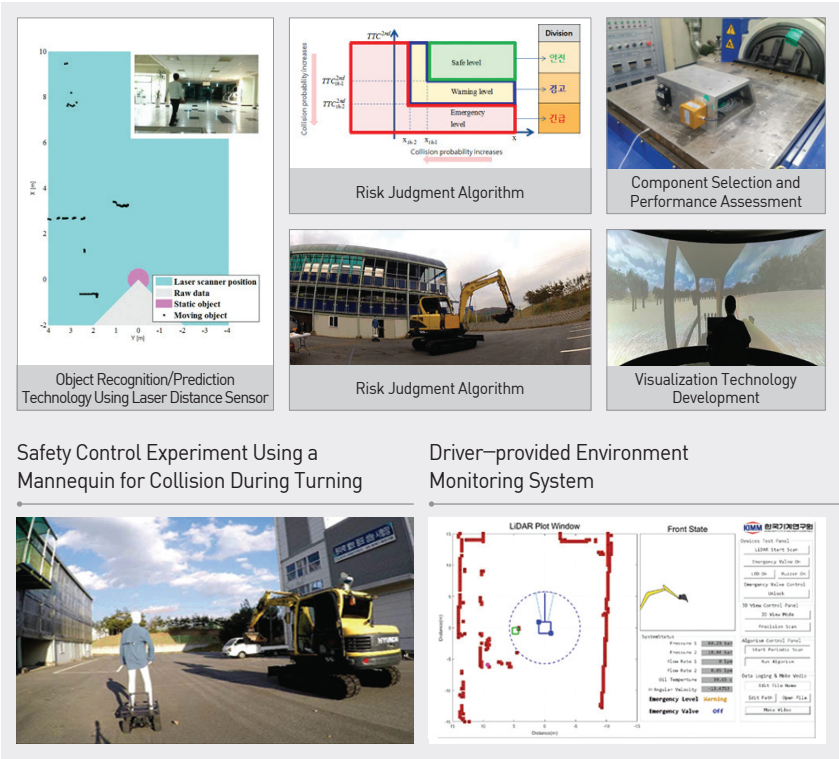
Current Intellectual Property Right Status

KNOW–HOW

- LiDAR data post processing (filtering, clustering, etc.) technology
- Object dynamic movement (speed) prediction technology
- Distance and time–based collision risk assessment
- Collision prevention safety control performance mounting/remodeling technology for excavator, etc.
- LiDAR–based 3D environment recognition technology