



Robot-based automation of charging process for electric vehicle

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Background and Motivation

- The demand for unmanned automatic charging systems using robot is increasing to improve the convenience of operation and to secure the safety of users
- Several researches on a robot-based automatic charging systems have been conducted
- Proposal of a novel concept of charging system which provides charging service for multiple vehicles with one robot

Fixed system



Youtube video, <https://www.youtube.com/watch?v=8UgT3ULwp-Y>

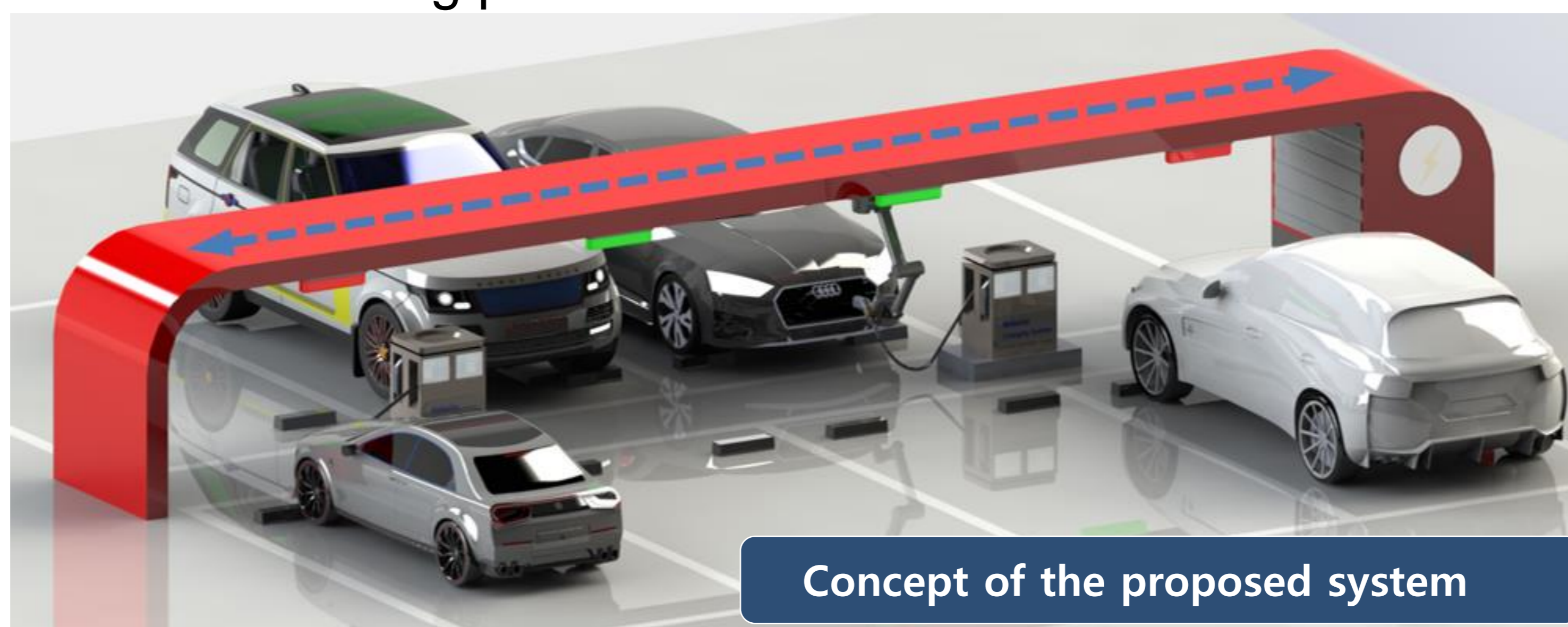
Mobile system



Youtube video, <https://www.youtube.com/watch?v=dftBK7ck650>

Goal

Development of collaborative robot and connecting algorithm of charging coupler for robot-based automation of charging process for electric vehicle



Concept of the proposed system

Workspace analysis and Implementation

- An analysis of the workspace and the load were conducted to calculate the required torque. The horizontal distance D and vertical distance H between the charging inlet of the vehicle and the center of the robot's 2nd axis was set as variables
- The system is composed of the bridge structure with the rail and the rack-pinion gear and the collaborative robot with the payload 15kg

