

Robotics team 3-2 proposal

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Project Title

Interaction System between Smart-city
and Self-driving car.

Building an efficient driving system
through interaction between
autonomous vehicles and cities



Purpose of the work (Goal)

1. Integrated development experience.
2. Development of an autonomous vehicle that recognizes obstacles.
3. Designing a future city.
4. Adding necessary functions to technology.

SELF-DRIVING CAR

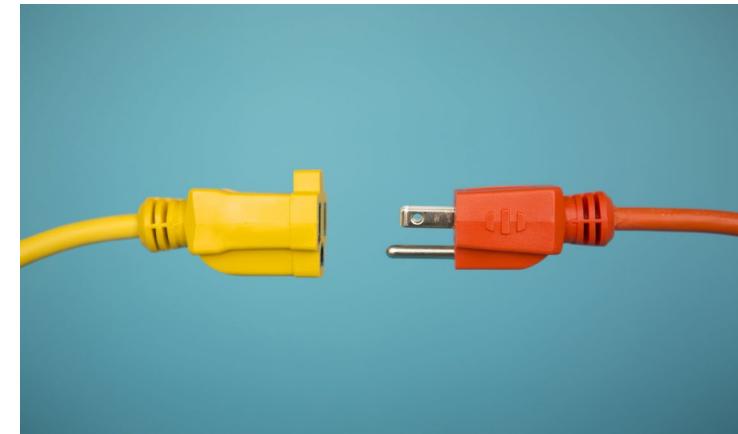
- Default : car goes straight, and the front sensor detects if there are objects.
- If the car detect an object less than 10 cm in front of it through ultrasonic sensor, it stops for 2 seconds and right side ultra sensor starts to detect.
- If the front sensor detects an object and the right sensor recognizes wall, the car turns left.
- If the front sensor detects an object and the right sensor didn't recognize wall, the car turns right.
- Autonomous head light system
- When the car enters the tunnel, the photoresister attached to the body recognizes the brightness and the headlight turns on

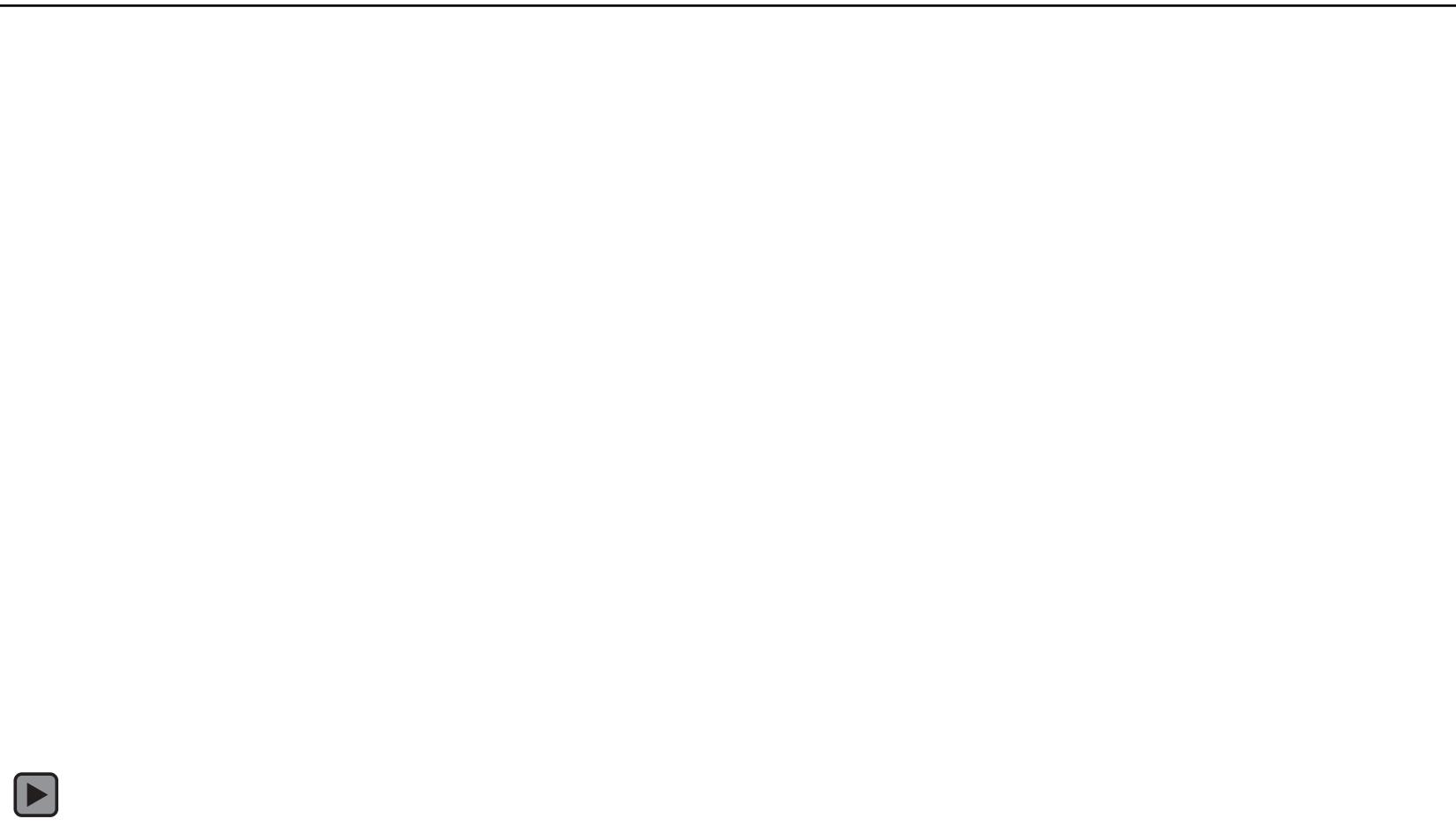




CHARGING SYSTEM

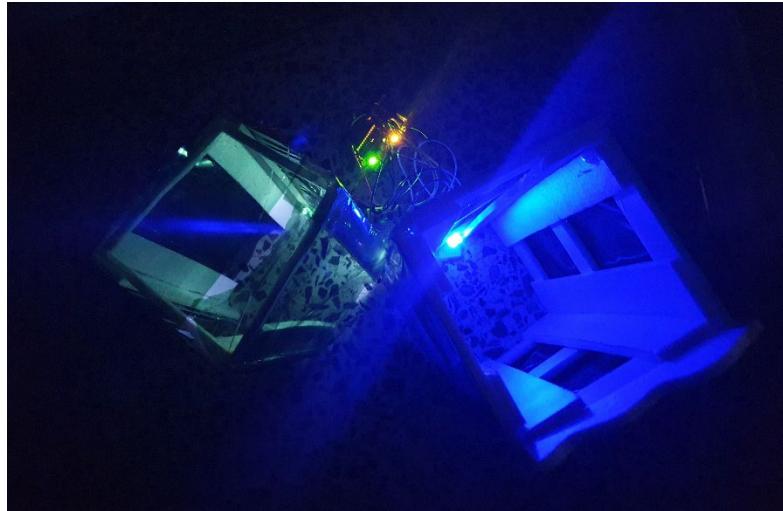
- The ultrasonic sensor detect less than 15cm objects. When it senses an object, lcd shows a welcome phrase and the device counts the time the car charges.
- When car leaves, the ultrasonic senses it, and lcd shows total charging time and cost.







Daytime



night

IOT BUILDING LIGHTING SYSTEM



The photoresister on the exterior wall of the building measures the brightness.



As it gets darker, the led gradually brightens depending on the value obtained by the photoresister.



There is a switch, so you can turn it off when you leave work or when you don't have to use the light

DIFFICULTIES WHILE IMPLEMENTING IT

- Color sensor detection error



HOW WE SOLVE THESE PROBLEMS.

- Use ultrasonic sensor which is relatively detectable than color sensor and we modified the algorithm so close to our project.



DIFFICULTIES WHILE IMPLEMENTING IT



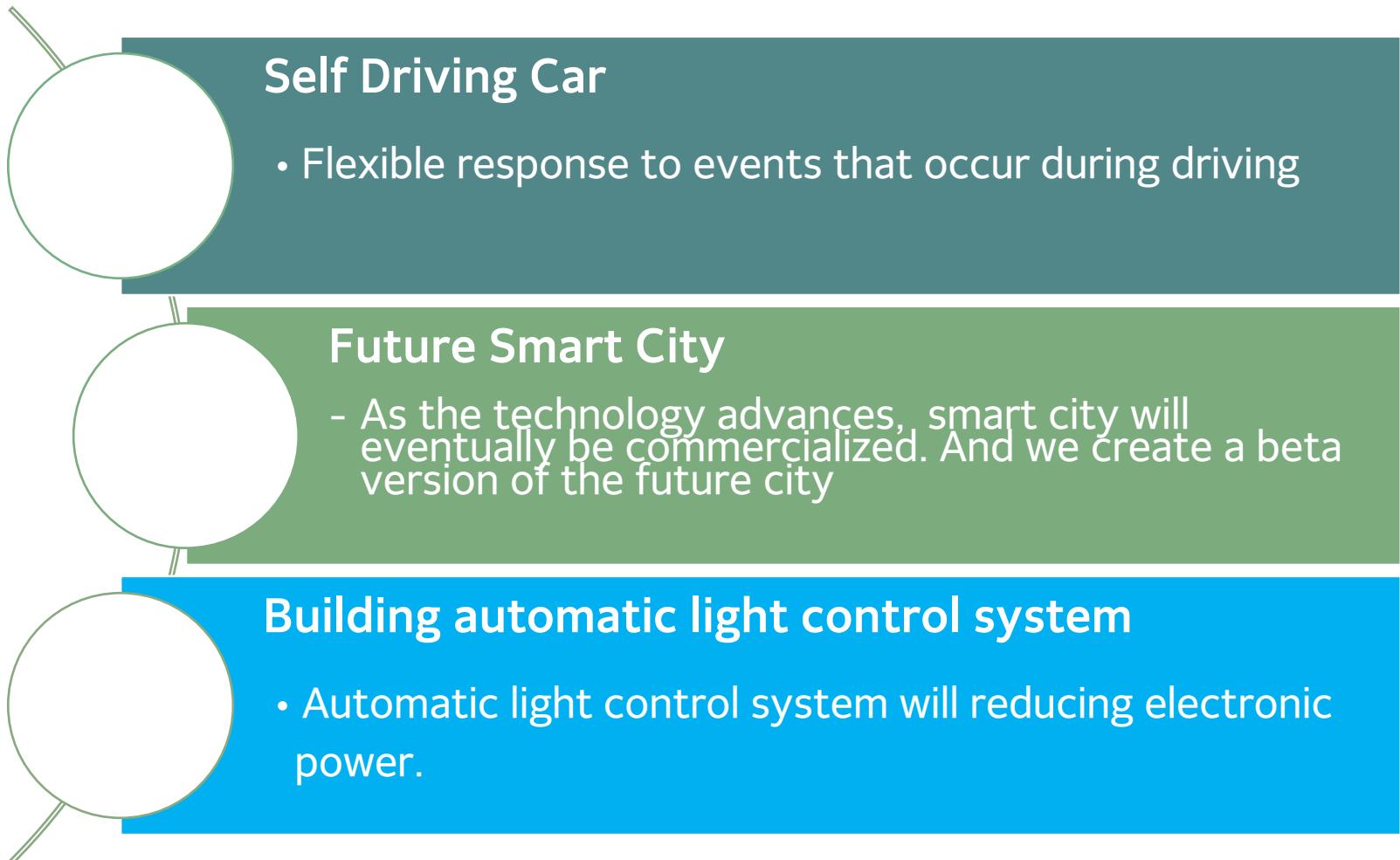
HOW WE SOLVE THESE PROBLEMS.

- The rear wheel of the car that came with the main body was not rotatable, so we replaced wheel with a wood look to control the center of gravity. Then, physical problem occurred that car is greatly resistant to small friction
- Power difference between two motors
- Rain water detection sensor is not compatible with Arduino
- We add the led to the bottom of the vehicle and minimize the friction.
- We kept testing and modified the code to find the right value of each motor.
- Exclude this function



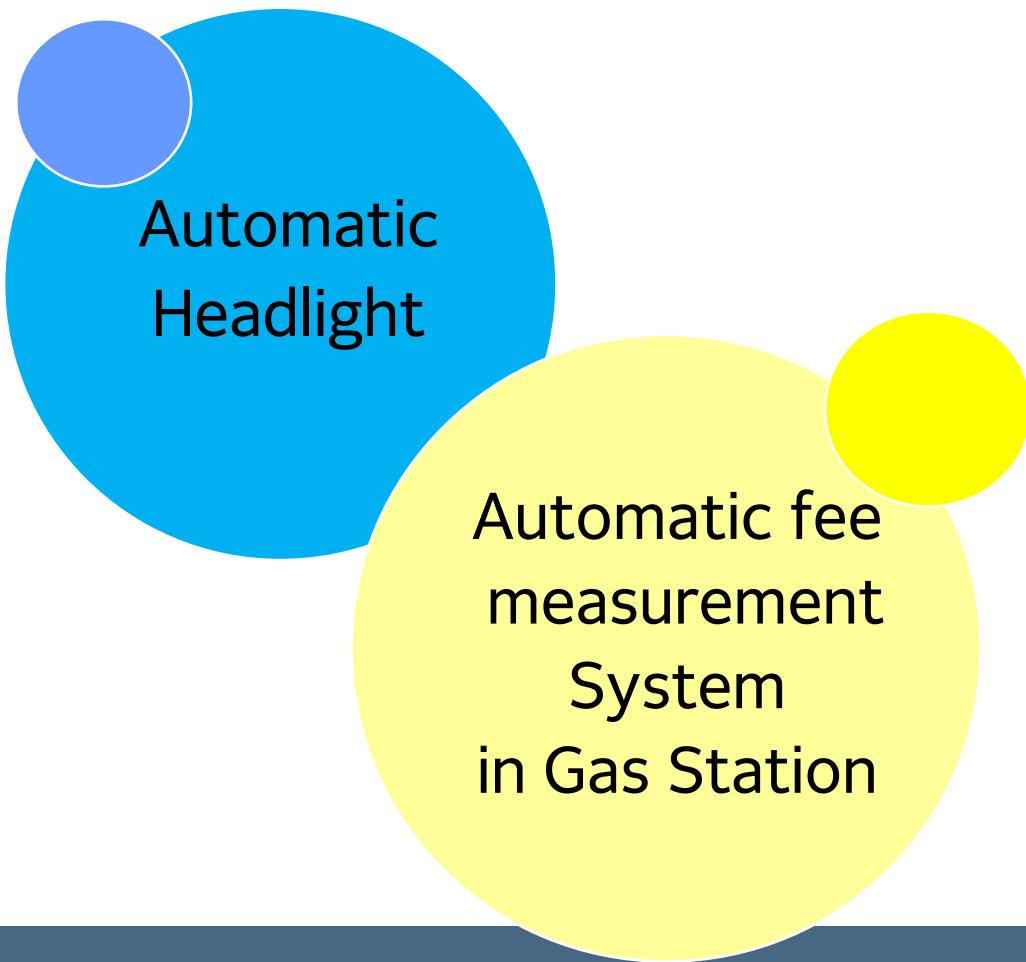
Value of our proposed systems

- Practical aspects



Value of our proposed systems

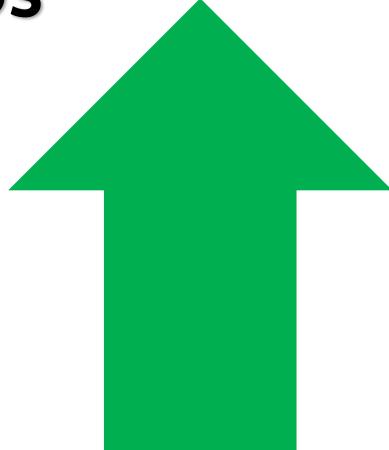
- Creative aspects



- Saving human right expanses
 - Reduce fuel costs
 - Economic revitalization.

Special points of our proposed system

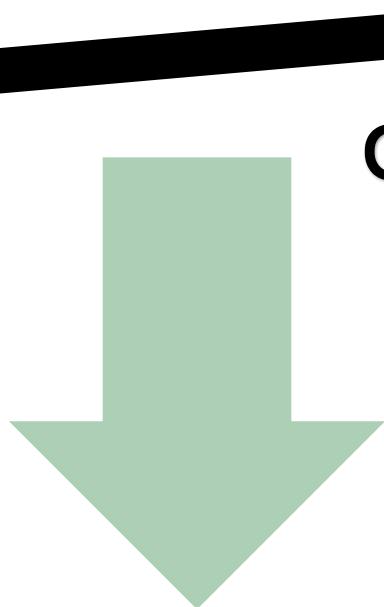
Pros



- Direct experience of smart city and self-driving car technology. (designing future city)
- Prevention of traffic accidents.
- Saving energy

Cons

- The limit of realization.
- Unfulfilled with aesthetic elements.



Special points of our proposed system

Automatic

- Self-driving cars, automatic charging systems, automatic building light control systems...
- We implemented everything automatically.

Detection

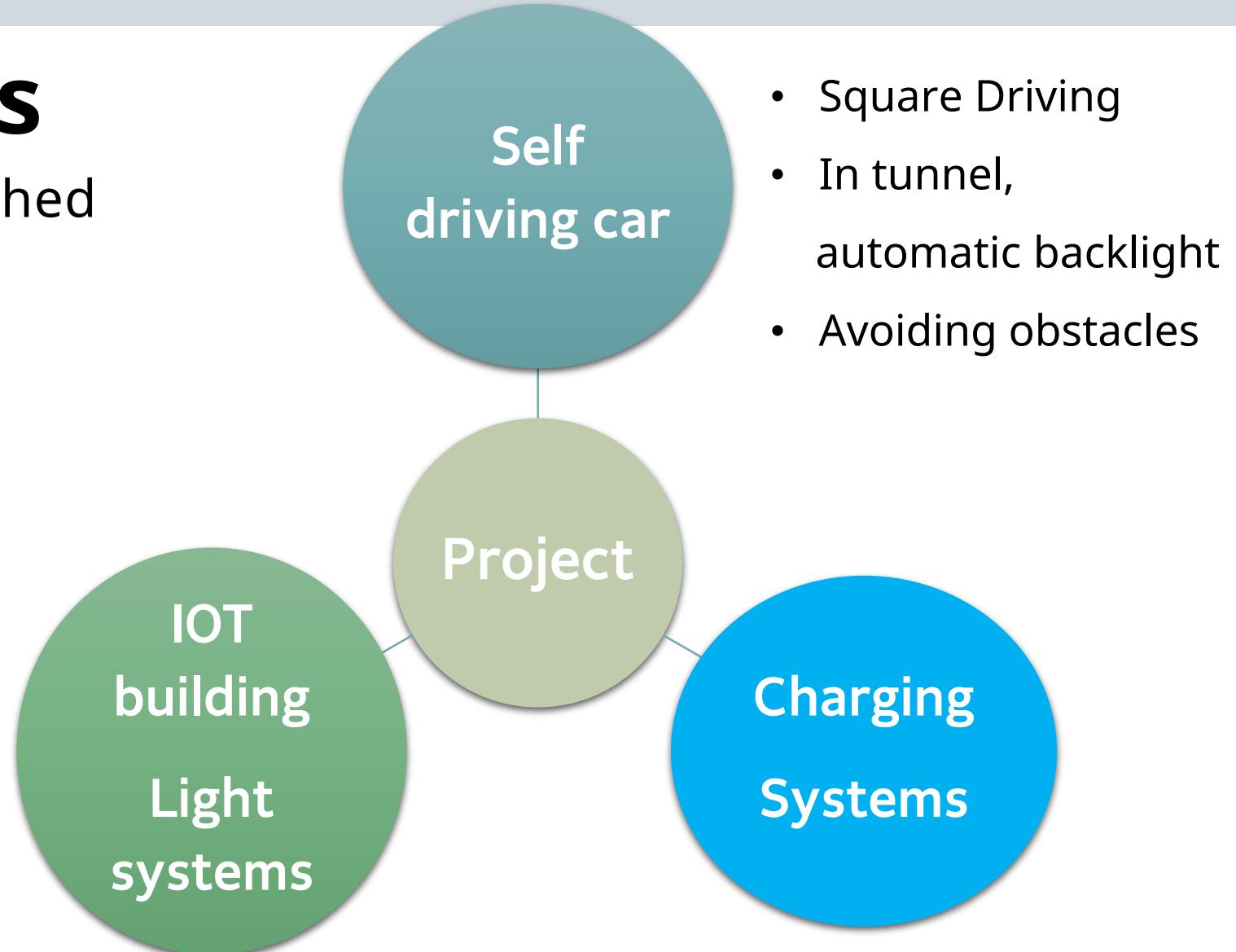
- Coping with the appearance of obstacles during the operation of autonomous vehicles.

Relation

- buildings and cars interact with each other (gas station)

Conclusions

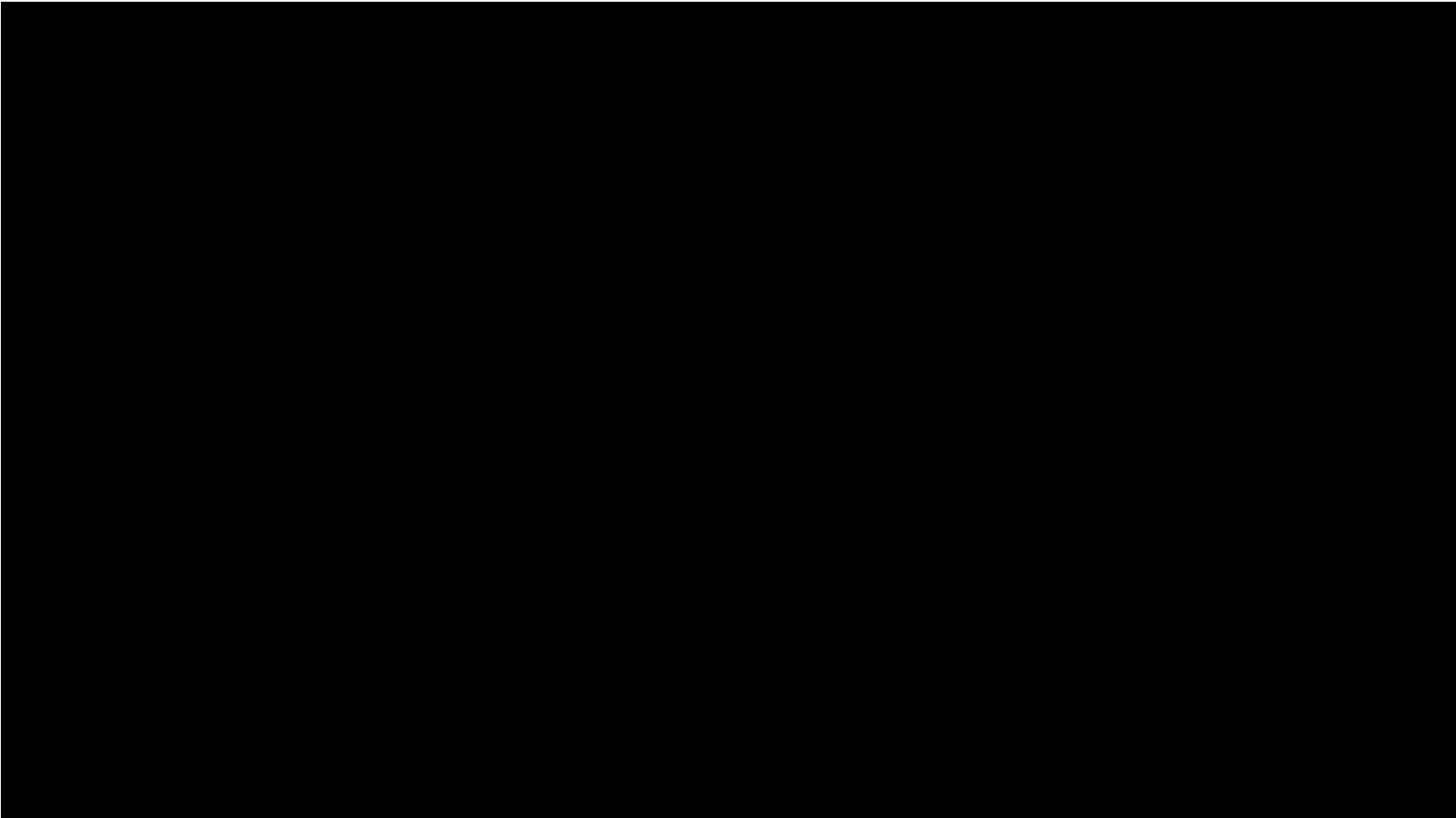
- What we accomplished



Conclusions

- What we able to do in the future.
 - ▶ Navigation function: Set a destination and move to a desired destination.
 - ▶ Vehicle sensor diversification: horn ringing function, temperature detection, etc.
 - ▶ Lane change function, etc.

- Final version



Role

Team member	Work (한/할 일)
Hojip Kim 201634121	Create video, Code Sketch, self-driving
Eunjung Song 202135547	Code Sketch, smart-city, PPT
Junha Cha 202135584	Presentation, Code Sketch, self-driving
Jiwoo Jeon 202035384	Code Sketch, smart-city, PPT

THANK YOU