Travel Elves
(Your personal travel secretary)

Presented by :Kuo-Che Chiu

國立交通大學
National Chiao Tung University

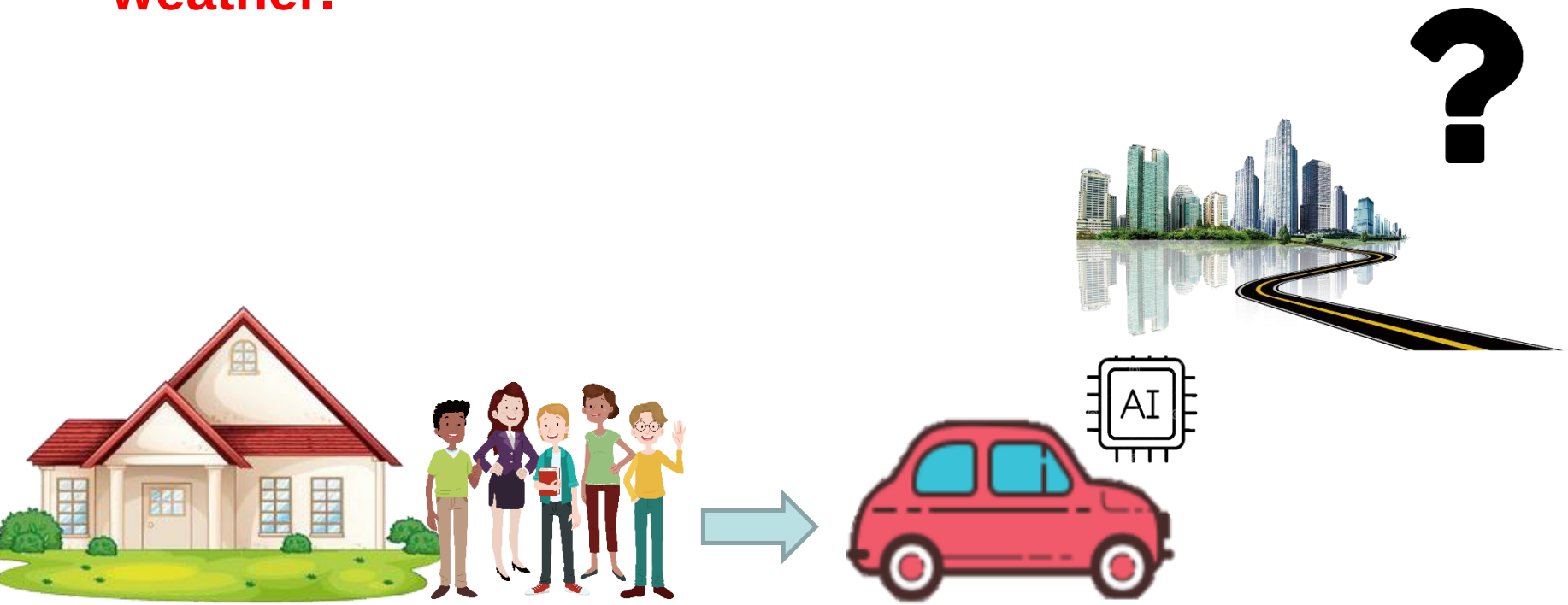
Fog Computing Alliance

Outline

- Issues and Idea
- Technologies for Our Travel Elves
- Demo Scenario

Issues and Idea

- In every weekend, People want to go outside of their city for traveling, but sometimes they put lots of effort to search where the cities are good spots.
- Although they arrange their schedule really well, it may also be delayed by traffic jams or canceled by the weather.



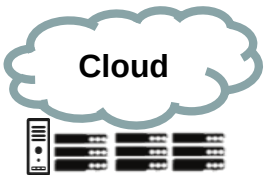
Issues and Idea

- Because of above reasons, I come up with a new idea call “travel Elves”
- Nowadays, there are lots of new applications work with 5G communication.
- Autonomous driving are a hot topic in 5G application, so I want to combine Autonomous cars and edge devices to cater people’s need for traveling

- **We use edges devices and cloud server to provide travel information and road condition**
  - **Travel information:**
    - ✓Cloud server provides famous spots and local foods which attract lots of crowds
    - ✓Depends on different people's requirement, customizes the travel schedule
  - **Road condition:**
    - ✓Devices analyze various routes to the destination and choose a suitable path for customers

Technologies for Our Travel Elves

- **For cloud:**
  - **Cloud server:**
    - ✓Use crawlers to collect each city's popular spots data from Internet and process the data to unfiled format
    - ✓ Use AI to update spots and customize personal travel schedule
- **For edge devices:**
  - **BSs:**
    - ✓Get travel schedule from cloud server, and provide suitable path to driver
  - **Road Monitors:**
    - ✓Provide real time road situations to RSUs
  - **RSUs:**
    - ✓Analyze data from Road Monitors, original route will be changed at any time by choosing smooth route without traffic jams
  - **Monitors:**
    - ✓Monitor real time road situation



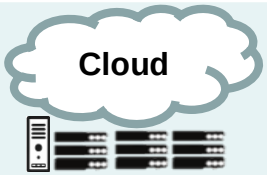
Cloud


BS


RSU

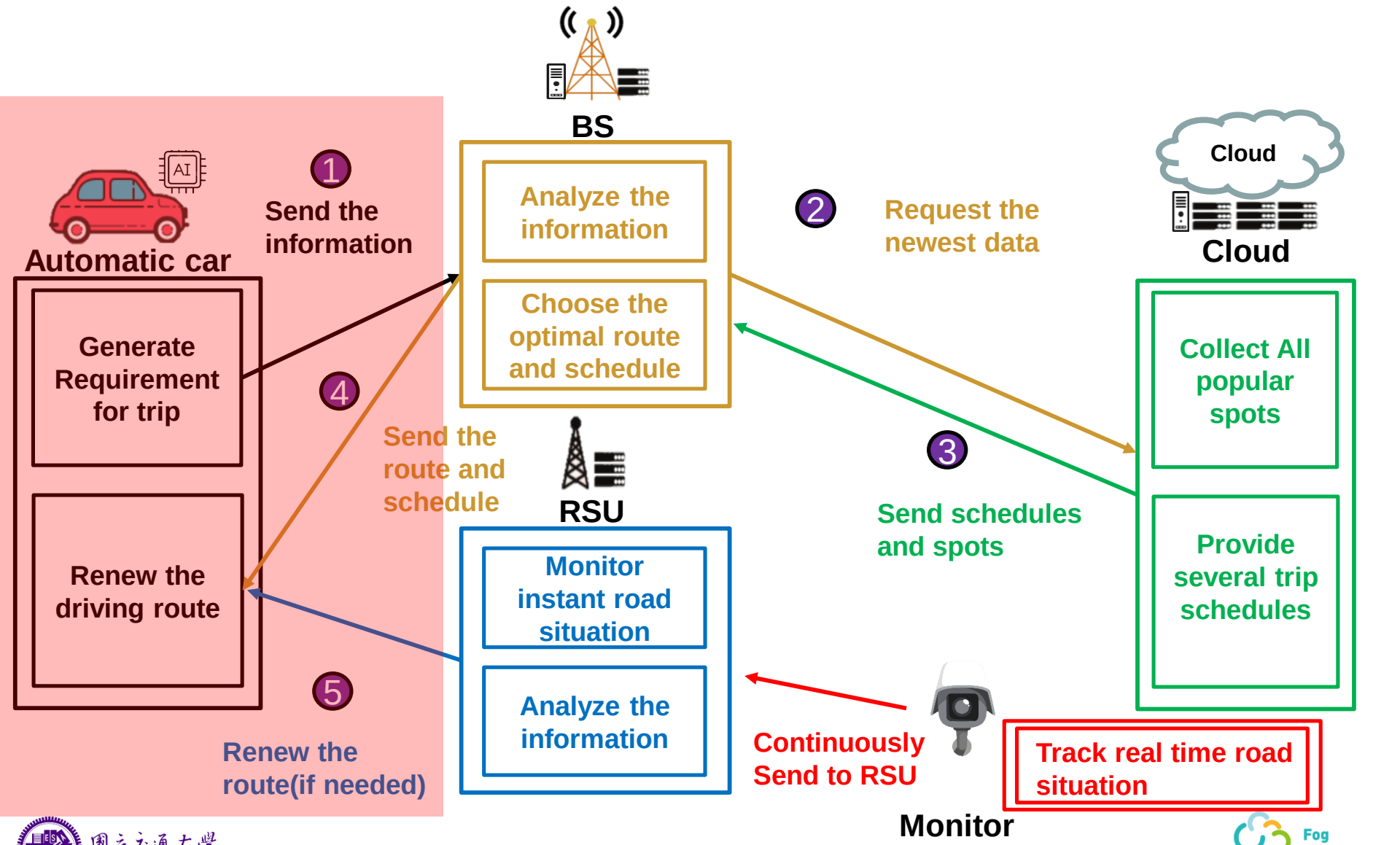

Monitor

The Information of Different Devices

Devices	Functions	Ability
Cloud server 	1. Cache global hot spots information. 2. Recommend trip schedule with user's requirement 3. Compute the task which BSs cannot afford.	Level: High
Monitor 	1. Cache road information 2. Compute the easy task 3. Track real time road situation	Level: simple
Base station (BS) 	1. Cache road information (big area). 2. Provide network services to cars. 3. Compute the task which RSUs cannot afford. 4. Provide travel schedule to the car.	Level: Medium
Roadside unit (RSU) 	1. Cache road information (small area). 2. Provide network services to cars. 3. Compute the task which cars cannot afford. 4. Help the car to change the path according to road situation	Level: Low
Tier4: Terrestrial (Car) 	1. Cache instant road information (specific area). 2. Compute real time data. 3. Identify traffic light and safe car distance.	Level: Low

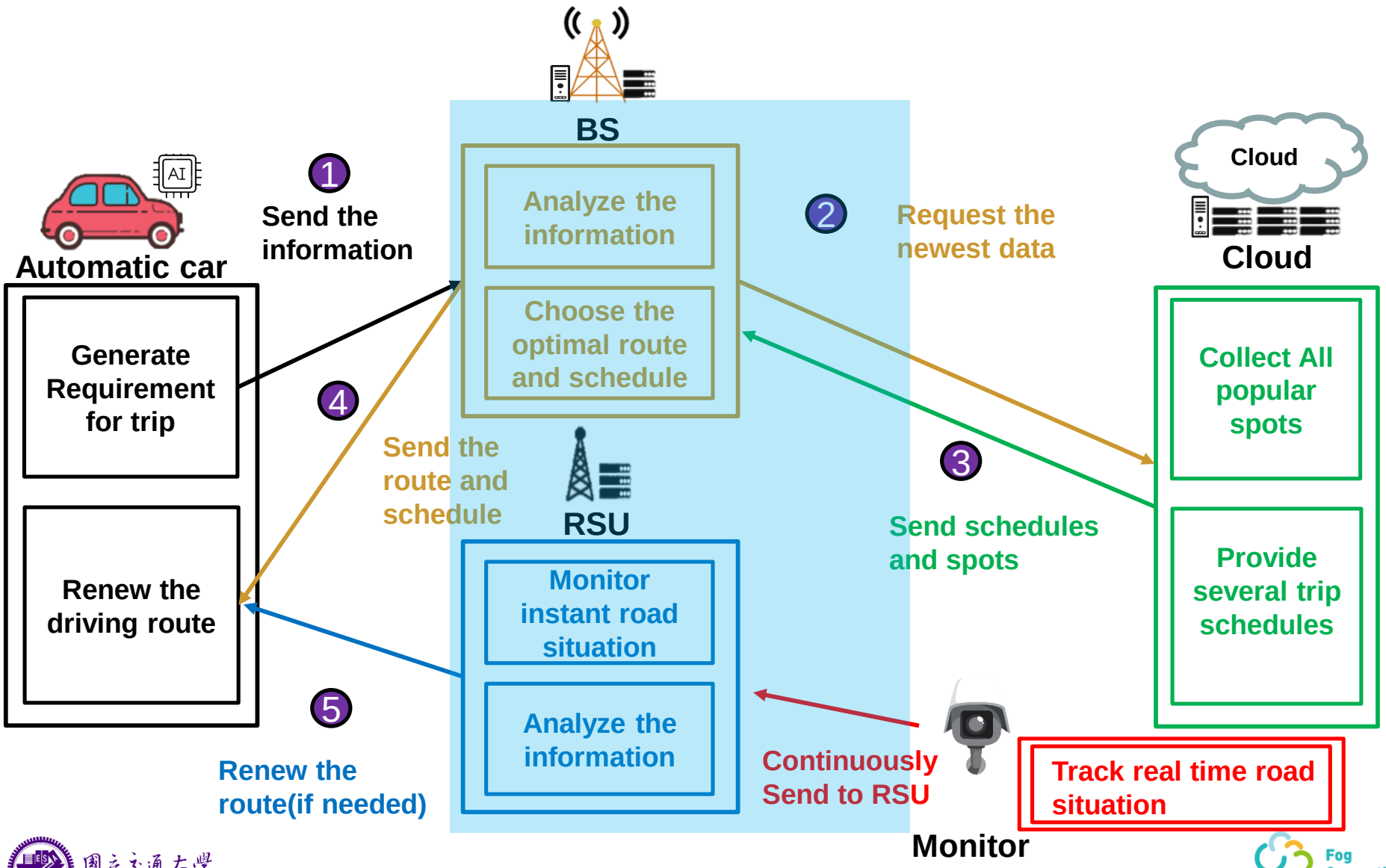
System Process

- According travel requirement, User sends the information to BS



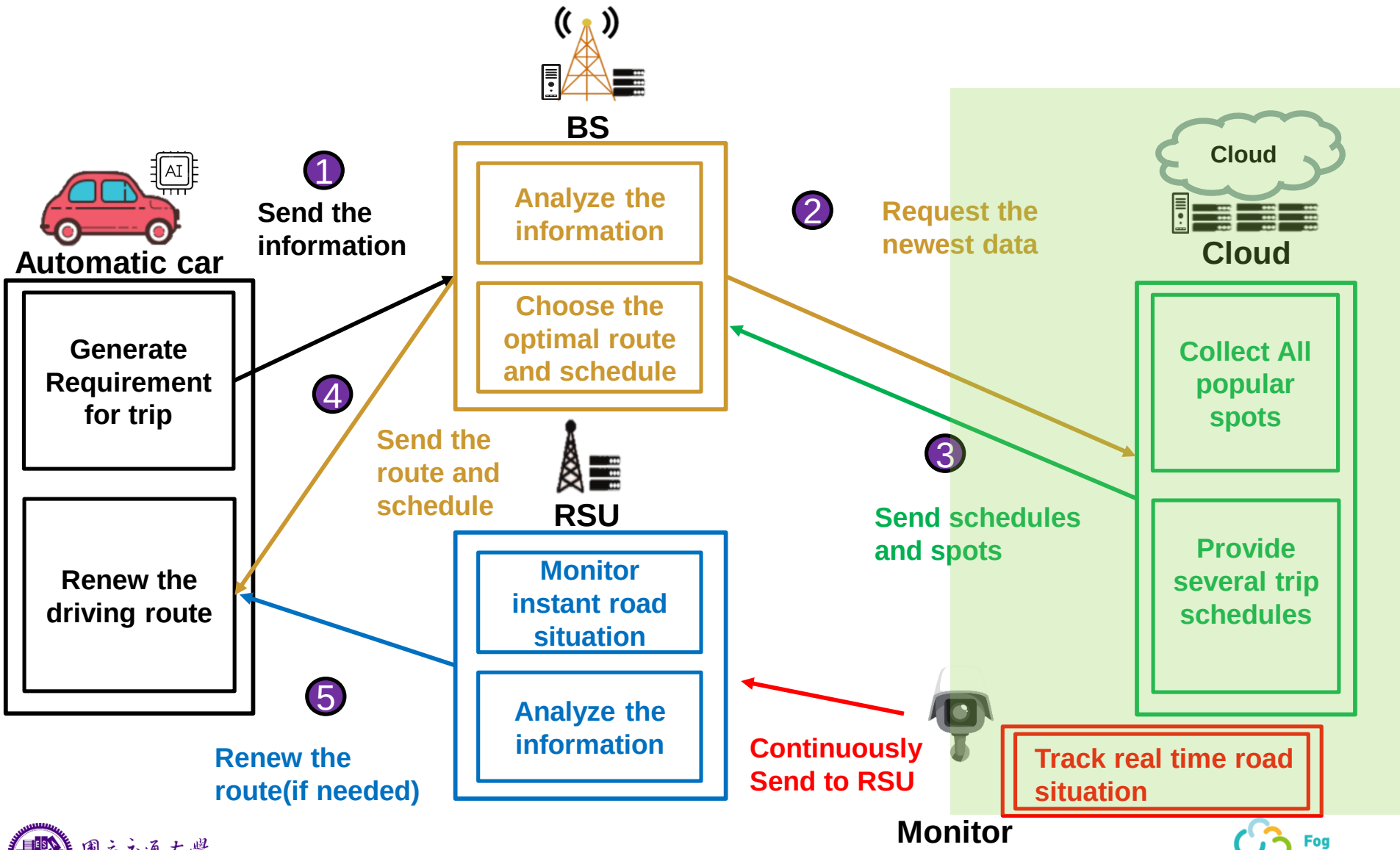
System Process

- BSs get the information from users and request Cloud get the newest data.



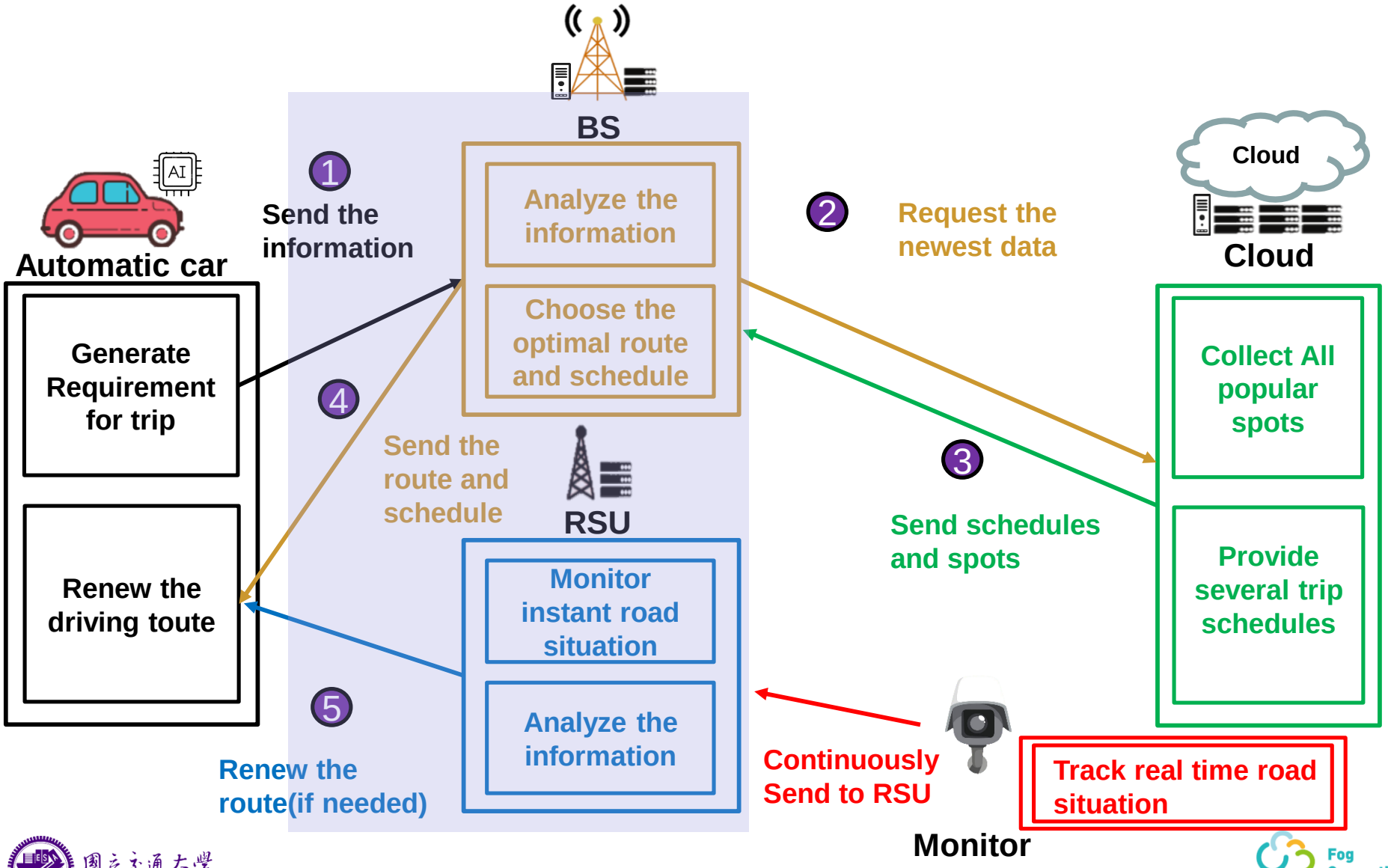
System Process

- Cloud send and spots and corresponding schedules back to the BS



System Process

- BS analyzes the data and find a best choice to match user's need
- RSU helps to renew the route if there has a traffic jams or accident at any time



System Process

- **In our proposal, we want to display the whole system by simulation**
  - **Cloud:**
    - ✓Use network crawler to catch online user's recommendation spots
    - ✓Use AI to filter not reality data and also generate several trip schedules
  - **BS:**
    - ✓Match user's need and provide suitable schedule and travel route
  - **RSU:**
    - ✓Renew the route which BS provide according to real time road situation
  - **Monitor:**
    - ✓Provide RSU real time road situation
  - **Autonomous Car:**
    - ✓ Get the information from BS and RSU and drive