<table>
<tr><td colspan="2">Disciplin / General field（专业方向）
Control Theory and Application,
Navigation, Guidance and Control,
Industrial Science, Artificial Intelligence</td><td>Project number（不填）
(to be completed by ECPk)</td></tr>
<tr><td colspan="3">Project title
Design and Implementation of Autonomous Quadrotor Formation Flight</td></tr>
<tr><td colspan="3">Project description（请填写项目简介和需要学生完成的工作）
Multi-agent systems can be used to solve problems that are difficult or impossible for an individual agent or a monolithic system to solve. Due to its broad applications in various areas, such as engineering, biological, physical systems, cooperative control of multi-agent systems has already been a hot topic in the control community.
Formation control is the foundation of cooperative control for UAV (Unmanned Aerial Vehicle) swarm systems. In this project, formation flight for quadrotor swarms with multiple constraints (communication delays, switching topology, measurement noise, etc.) remain to be studied.
The students need to achieve the following goals:
(1) Perform hovering, take-off, landing, and trajectory autonomous tracking of a quadrotor in the condition of state estimation and PID control
(2) Accomplish autonomous formation flight of a multiple quadrotors swarm by using consensus-based formation control approach.
(3) Design flight paths with artificial Intelligence method, in which each quadrotor is able to avoid obstacles and other quadrotors.
(4) Complete formation flight experiment of quadrotor swarm in simulation/indoor environment.</td></tr>
<tr><td>Contact person in the client company（如果有企业资助，填写企业联系人，没有可以不填）</td><td>Project coach
（导师姓名，必填）

Liang HAN</td><td>Scientific referent (to be completed by ECPk)

Liang HAN</td></tr>
<tr><td colspan="2">Client company (name, adress)
（学院名称，地址等）
Sino-French Engineer School,Beihang University,
37 Xueyuan Road, Haidian District, Beijing</td><td>Logo of the company</td></tr>
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