Cloud and Edge Computing Based Movable 3D Dynamic Image Recognition and Analysis Layer System for Remote Biological Laboratory

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Abstract—Animal experiments are very important for the validation of pharmaceutical and biotech-related products. To reduce the risk of the affection corresponding to the accuracy and safety of the experiment, this research provide the remote image recognition and analysis based on cloud computing for system management and local edge computing with artificial intelligence integrated with the movable platform. According to the dynamic image recognition, the 3D position of the unmanned movable platform could be located calibrated. Based on the proposed layer structure, the cages or boxes of the animals could be monitored and surround viewed. The local edge computing device on the movable platform could complete the 3D dynamic image recognition of the animals corresponding to the position recognition based on the artificial intelligence service. In addition, the artificial intelligence service could be managed and updated automatically through the network based on the remote cloud with less manual operation cost.

Keyword—Artificial Intelligence, Image Recognition, Edge Computing, Cloud Computing, Unmanned System

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