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Vertical take-off and landing (VTOL) aircraft can take off, hover, and land vertically without relying on a runway. Electric VTOL (eVTOL) aircraft use electric power to hover, take off, and land vertically, and can have applications in civilian usage for urban commute, air taxi, delivery, medical assistance, and military. Well-posed machine learning problems, such as designing and training a machine learning model that can function as an autonomous system capable of safely flying air taxis in real-time avoiding collisions, are crucial in machine learning projects. The three important components of a well-posed learning problem are the task, performance measure, and experience. In the case of autonomous personal air travel vehicles (APAVs), the task is to fly the eVTOL/air-taxi safely and efficiently, while the performance measure includes factors such as travel time, passenger comfort, and energy consumption. The experience can be historical data of labelled examples of sensor readings and corresponding control commands provided by the pilot or training experience provided by reinforcement learning. Defining a well-posed machine learning problem helps to ensure clarity, appropriate data collection and analysis, accurate and efficient model selection and training, and efficient allocation of resources.

The objective of the Autonomous Personal Air Travel Vehicle (APAV) project is to design and train a machine learning model that can function as an autonomous system for air taxis. The well-posed machine learning problem involves defining the task of safely and efficiently flying the eVTOL aircraft while passengers are on board, the performance measure of minimizing travel time while ensuring passenger comfort and safety, and the experience of historical data and reinforcement learning. Defining this problem statement helps to ensure clarity, appropriate data collection and analysis, efficient model selection and training, and allocation of resources.

Signature – Name – Date

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