A lot of research activities in aerial and underwater vehicles have been done not only for developing efficient platforms, but also for making them intelligent. The intelligent autonomous system in vehicles especially permits the vehicles to perform surveillance, reconnaissance missions and environmental monitoring without the human supervision. This technology generates various applications of the platforms in research and entertainment fields.

The development of unmanned autonomous vehicles has been of great interest, in which different kinds of autonomous vehicles have been studied and developed all over the world in recent decades. As a development of an intelligent system, UAVs (unmanned aerial vehicles) were born to support the military applications at the early stage of development. Recently, however, the demand has arisen for UAVs to be used in emergency situations and in industrial applications. UAVs are expected to support rescue for the situation unreachable by human in a dangerous disaster, such as earthquake, flood, volcano or nuclear disaster.

In addition to UAVs, biologically-inspired robotics has also received much attention recently. As an interdisciplinary field between biology and robotics, it is often referred as biomimetic robots or bio-robotics. The approach of biologically-inspired robotics development is often done by applying biological motivations or ideas to engineering problems or by using robots as physical models to answer biological questions.

In order to understand the achievements in the development of the unmanned aerial and underwater vehicles, this chapter presents the contents of the 12(13) papers presented in IAS-12, which are introduced in the category of autonomous aerial/underwater vehicles, bio-inspired flight, and special environment localization/navigation.

The papers related to bio-inspired flight cover the basic principles of specific natural species, strategy to mimic the features, fabrication and experimentation of flight systems, and their findings. Potential applications of flapping-wing systems are also discussed.

In the unstructured environment, such as under-water, air and disastrous area, the localization/navigation technologies are essential for rescue and construction. The measuring devices and algorithms for the localization/navigation are discussed in the papers related to the development of underwater robot. These papers introduce the
recent progress on underwater vehicle robots including its control method, simulation and flow analysis. These papers are also aimed at sharing the latest accomplishments and innovations in autonomous technologies of underwater vehicles and providing their potential future directions.

In this chapter, the contents of 12 papers presented in IAS-12 are introduced in the category of autonomous aerial/underwater vehicles, bio-inspired flight, and special environment localization/navigation.