Yasushi Yamaguchi received the doctoral degree in geology from Tohoku University, Sendai, Japan, in 1989. From 1984 to 1986, he was a Visiting Scientist at Stanford University, Stanford, CA, USA. He is currently a Professor with the Graduate School of Environmental Studies, Nagoya University, Japan. Dr. Yamaguchi served as the Dean of the graduate school from 2009 to 2011, the President of the Remote Sensing Society of Japan (RSSJ) from 2012 to 2014, and is currently the Chair of IEEE Geoscience and Remote Sensing Society (GRSS) Japan Chapter. He is also the Japanese ASTER Science Team Leader.

Remote Sensing technologies are continuously advancing and cruising in daily lives of human being. It is time to sit back and reflect on past and envisage the future development. Prof. Yamaguchi has vast experience in teaching and research of remote sensing and its applications in environmental and geological studies. It is my honour that he agreed to share his experience and views with the readers of IJG. He has also contributed greatly in nurturing scientists through his active role in JVGC (Japanese Vietnamese Geoinformatics Consortium) and being Associate Editor.

NT: Prof. Yamaguchi, thank you so much for your precious time to spend for International Journal of Geoinformatics and agree to share your valuable experience. Please reflect on your journey of research in remote sensing.

YY: I started studying remote sensing when I joined the Geological Survey of Japan in 1980, and was put in charge of the nationwide airborne radar mapping. Since then I have been involved in the various remote sensing projects such as JERS-1, ASTER on Terra, and LRS on Kaguya. My background is geology, and I currently belong to Graduate School of Environmental Studies, Nagoya University. So I am interested in a variety of remote sensing applications including geological and environmental studies.

NT: Prof. Yamaguchi, can you give an overview of development in remote sensing technologies?

YY: From the sensor development point of view, spatial, spectral and temporal resolutions are significantly improving. Accordingly we need to develop novel data processing and integration techniques. For example, development of spectral unmixing algorithms is a popular research topic in response to development of hyperspectral sensors. Another important trend is derivation of geophysical parameters from remotely sensed data. A good example is estimation of carbon fluxes by combining satellite observation data and an ecosystem model.

NT: What are the major contribution of remote sensing technologies in disaster management and mitigation?

YY: Remote sensing is very powerful for rapid damage assessment over a wide area in case of a disaster. We can also utilize remote sensing as a useful tool for in-depth investigation of a disaster, for development of a recovery plan, and for education of people to mitigate damages. In fact, when we encountered the aftermath of the 2011 Tohoku earthquake and tsunami in Japan, remote sensing played a significant role in these areas.
Interview of Prof. Yayushi Yamaguchi by Editor-in-Chief Prof. Nitin K. Tripathi

NT: You have done great deal of research in climate related studies like urban heat island etc. Please share your experiences?

YY: We are currently experiencing two kinds of warming: global warming due to CO2 accumulation in the atmosphere and local warming due to the urban heat island effect. People think that the anthropogenic heat discharge is a major cause of the urban heat island. However, our analysis indicated that alteration of the natural land surface to the artificial materials such as asphalt, bricks and concrete gave even a larger effect in raising the temperature in urban areas. We think it is very important to estimate these effects quantitatively in a regional scale by using remotely sensed data.

NT: What do you think about UAV and its role in future of remote sensing?

YY: I am confident that UAV has a tremendous ability. In some applications, it is obvious that UAV is superior to satellite remote sensing. For example, UAV can provide valuable data with higher spatial resolution and more frequent revisits over a relatively narrow agricultural area compared with satellite observations. We really need to recognize advantages and disadvantages of different platforms, UAV and satellite in this particular case, and to choose the appropriate one or to combine multiple observations to generate synergy.

NT: Few countries in Asia have their satellites but majority do not. Do you have any suggestions on data availability to them at no or very little affordable cost?

YY: In case of medium resolution satellite remote sensing such as Landsat, data are available for free. I believe that this fundamental trend should be irreversible and be maintained. In case of high resolution data, we strongly hope to have a sort of mechanisms that allows researchers to obtain data for free or at very little affordable cost for non-commercial research use. We would greatly appreciate assistance by data providers.

NT: You have been involved in Remote Sensing education. Is there any change needed?

YY: Remote sensing includes state-of-the-art technologies. For example, new data obtained by a hyperspectral sensor and LIDAR are becoming available and being disseminated to many application areas. So, we really need to maintain our education consistent with the latest technologies, and to keep accessing such new data. Again we would appreciate continuous assistance by data providers. I believe that it would be also beneficial to data providers if they contribute to educating young people.

NT: What should be the focus of research in remote sensing in the context of sustainability of earth and also for development?

YY: I think that one important topic is monitoring of urbanization. As you know, population inflow from rural to urban is progressing both in developing and industrialized countries. Rapid population inflow and motorization cause disordered urban expansion and sprawl that require a heavy cost to maintain infrastructures. Remote sensing can provide spatial and temporal data to monitor and analyze urban growth and land cover change, and would allow city planners and decision makers to think about appropriate urban development plans.

NT: What is your message to young researchers and developers?

YY: Having enough background knowledge in a particular application area, you will be able to fully utilize remote sensing as a powerful tool. On the other hand, if you get used to utilizing a remote sensing technology, you will be able to apply the technique to the other application areas as well. I would encourage young researchers and developers to challenge new application areas with a wider perspective. You are fortunate because you are studying remote sensing which certainly can broaden your view and experience.