

I am Yongjoon Choi, a D1 student from the Materials & Engineering Lab. at The University of Osaka, led by Prof. Takahiro Hayashi and Prof. Naoki Mori. From September 1st to 3rd, the 2nd Annual Meeting of the Japan Additive Manufacturing Society was held in Hakodate, Hokkaido. This is my report on the conference.

On the first day, Prof. Hayashi, Harada-kun, an M1 student, and I traveled from Itami Airport to Hakodate Airport. After leaving our luggage at the hotel, we headed to the conference venue.



Hakodate has a well-established tram system, which is relatively uncommon in many other Japanese cities. We frequently used the trams to travel between our hotel and the conference venue, and they made transportation during the conference very convenient.



The first day mainly consisted of special and keynote lectures. Most of the talks provided broad perspectives on additive manufacturing (AM), covering topics such as the history of AM, its economic impact, future technologies, and various applications. I particularly tried to understand areas that were still relatively unfamiliar to me, such as the overall manufacturing workflow of AM and standardization. I also noticed that many speakers emphasized the importance of quality assurance, which is of course essential in AM. For me, this was both an encouraging sign and a strong motivation for continuing my research on in-process inspection. Unfortunately, many of the photos I took were translated into Korean on my device, so I do not have many original photos of the presentation slides that I can include in this report.

After the lectures, there was a conference banquet. Prof. Hayashi and I tried to meet researchers who could help us broaden our connections within the AM field. We moved around the venue and talked with researchers working on a wide variety of AM-related topics. Many kinds of Japanese food were served, and I remember that

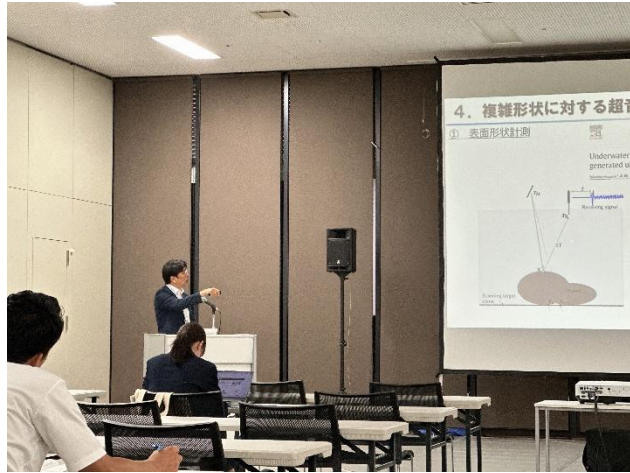


everything was excellent. One thing I personally found a little unfortunate was that the banquet was held on the first day. I felt that if it had been held after some people had given their presentations, it might have been easier to start conversations based on each other's research and discuss our work in greater depth.



The second day featured more specialized presentations covering a variety of fields related to AM. For example, technologies currently being studied for aerospace, medical, chemical, and materials applications were introduced. There was also a Japan-Korea AM Symposium session, so I paid particular attention to those presentations. Many of the researchers from Korea were from government-funded research institutes such as Korea Institute of Materials Science (KIMS) and Korea Institute of Machinery & Materials (KIMM). They introduced several interesting and relatively uncommon topics, including AM-fabricated bone grafts and magnetic materials for AM. The topic I found most interesting was Small Modular Reactors (SMRs). Since SMRs are also becoming an important topic in the field of nondestructive evaluation (NDE), I found it interesting to see that they are receiving significant attention from the AM community as well. I also had the opportunity to meet a professor specializing in materials engineering from my previous university, Changwon National University, and we exchanged ideas and discussed our research.

The final day was an especially important one for our group, as Prof. Hayashi gave an oral presentation, while Harada-kun and I presented our work in the poster session. Prof. Hayashi delivered his presentation very smoothly, and many members of the audience listened with great interest. He introduced several different technologies based on laser-generated ultrasound and also took the opportunity to promote the posters presented by Harada-kun and me during his talk. (Thank you, Prof. Hayashi!)



Harada-kun and I also successfully completed our poster presentations. More people visited our posters than I had expected, and I ended up spending almost the entire 90-minute session explaining my research and answering questions. My throat was a little sore afterward. My presentation was titled "Manufacturing and Inspecting with a Single Laser: In-process Defect Imaging in Laser-based Powder Bed Fusion." Most of the questions I received were practical and application-oriented, such as: "Is the inspection time reasonable for actual manufacturing?", "What is the minimum defect size that can be detected?", and "How deep can defects be detected?" Because AM is a highly interdisciplinary field, I realized that many researchers approach our work from perspectives that are different from those commonly encountered in the NDE community. Rather than focusing mainly on fundamental or theoretical aspects, many of their questions focused on how the proposed technique could actually be implemented and used in an AM process. This aspect of the conference (the opportunity to encounter different perspectives from researchers in other fields) had a significant impact on the way I think about my own research.



After all the presentations had finished, Prof. Hayashi reserved a very nice restaurant for us and treated us to a great dinner. Hakodate is famous for its seafood, and he ordered several dishes that were new to me, including squid sashimi, Hokke sashimi, whale meat, and so on. Everything was delicious.



ごちそうさまでした！

I would also like to thank Prof. Hayashi for sincerely discussing some of my personal concerns and my future direction as a researcher. I greatly appreciated the opportunity to talk about these matters outside the usual research environment.



Finally, before returning to Osaka, Harada-kun and I visited the famous Goryokaku Tower and had hamburgers at Lucky Pierrot, a well-known local hamburger restaurant found only in the Hakodate area. The view from Goryokaku Tower is shown below.





Overall, I found the conference very interesting and valuable. Because our primary expertise is not AM itself, I believe there was even more for us to learn from researchers working directly in the AM community. The conference also made me realize more clearly how researchers and engineers in AM evaluate inspection technologies from a practical perspective. In particular, the questions I received regarding inspection time, detectable defect size, and inspection depth provided useful directions for improving our current research. Going forward, I will continue working to establish myself as a researcher representing in-situ inspection of additive manufacturing using laser ultrasonics. Finally, I would like to sincerely thank Prof. Hayashi for giving me this valuable opportunity, and Harada-kun for taking care of me and making the entire conference trip enjoyable. ありがとうございました！