

Report

The 4th World Congress on Industrial Process Tomography

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Abstract: The 4th World Congress on Industrial Process Tomography (WCIPT4) was held in Aizu, Japan, from September 5 to 8, 2005 (home page: <http://www.vcipt.org.uk/wcipt4/>). The congress venue was OnYado Toho, a traditional Japanese hotel in Higashiyama Onsen, which is approximately 15 minutes from Aizu-wakamatsu station by car and approximately 4 hours from Narita Airport by train and shinkansen. The congress attracted 183 participants from 21 countries. Eight categories of parallel sessions and two poster sessions were held. A total of 174 papers were presented, including 3 invited lectures and 40 posters. In the plenary lectures, Professor Xi-Cheng Zhang presented "Terahertz Wave Imaging Technology", Professor Lynn Gladden explained the "Latest Development in Dynamic MRI of Multi-Phase Systems", and Professor Hideaki Koizumi discussed "Optical Topography for Higher-order Brain-function Imaging and its Practical Applications". The congress also incorporated some local events, including a technical tour of the University of Aizu. The university staff introduced the state-of-the-art computer facility. In addition, a city sightseeing excursion visited Tsurugajo Castle and a sake museum. All attendees enjoyed lavish dinners with traditional Japanese entertainment in the evenings.

Keywords: Tomographic sensor design, Data reconstruction and fusion, Visualization and image analysis, Flow imaging, Chemical reactor engineering, Process modeling and control, Industrial application and innovation, Nuclear engineering.

1. Introduction

The 4th World Congress on Industrial Process Tomography was organized by the Virtual Centre for Industrial Process Tomography (VCIPT), and the Visualization Society of Japan (VSJ). The VCIPT was established in 1996 through the major Technology Foresight Challenge initiative by academic researchers from the Universities of Leeds and Manchester. The VCIPT promotes the interaction of industrial participants with a highly multi-disciplinary research group comprising 30 university staff, with a primary aim of advancing the field of industrial process tomography in order to meet the long-term needs of its participants. The VSJ collaborated with the VCIPT in order to integrate a wide range of research skills (including computing, electronics, mathematics, physics, process engineering, and particle science) through WCIPT4. These skills are interfaced with process users from sectors as diverse as food, minerals, pharmaceuticals, and petrochemicals.

The inaugural WCIPT was held in Buxton (Derbyshire, UK) in 1999, with the 2nd held in Hanover (German) in 2001, and the 3rd held in Banff (Canada) in 2003. The main themes of this 4th congress were tomographic sensor design, data reconstruction and fusion, visualization and image analysis, flow imaging, chemical reactor engineering, process modeling and control, industrial application and innovation, and nuclear engineering.

Process tomography is a technique that allows process manufacturers to estimate the spatial distribution of phases inside their processing vessels or pipelines. Three-dimensional images can be reconstructed from non-invasive peripheral sensing. Thus, process tomography for industrial processes is similar to body scanning in medicine.

2. WCIPT 4

The 4th World Congress on Industrial Process Tomography (WCIPT4) was held at OnYado Toho, a traditional Japanese hotel (shown in Fig. 2) in Aizu, from September 5 to 8, 2005. The chairperson of the congress was Professor Shigeaki Tsunoyama, who is the Vice President of the University of Aizu, the vice chairpersons were Professor Toshiki Iino of the University of Tokyo, who is President of the VSJ, and Professor Richard. A. Williams of the University of Leeds. The general secretary of the local organizing committee was Dr. Masahiro Takei, who is an Associate Professor at Nihon University. The congress venue, OnYado Toho, is located in Higashiyama Onsen in the Aizu-wakamatsu region of Fukushima Prefecture, which is approximately 4 hours from Narita Airport by shinkansen. Higashiyama Onsen is the most famous hot spring in northeastern Japan. The sodium chloride in the hot spring is beneficial for rheumatism, neuralgia, and stomach problems.

As shown in Table 1, 170 researchers, engineers, and students from 21 countries around the world attended the congress. The majority of the participants came from Japan and the UK. Table 2 shows the distribution of the 174 lectures, including invited lectures, based on topic. Parallel sessions were held and focused on the following 8 themes: tomographic sensor design, industrial application and innovation, process modeling and control, chemical reactor engineering, data reconstruction and fusion, visualization and image analysis, flow imaging and nuclear engineering. All of the lecturers presented novel findings in their respective fields.

The congress was opened in an opening ceremony held following lunch on September 5, the first day of the conference. After the ceremony, a plenary lecture and general lectures for three parallel sessions were held. In the welcome party, held during the first night of the conference, a lavish dinner (including Japanese sushi and tempura) was served and gorgeous traditional Japanese dances were performed by geisha (Japanese traditional female entertainers, shown in Fig. 3). On September 6, the second day of the conference, 49 general lectures were held in the parallel sessions. After the general lectures, a technical tour of the University of Aizu was conducted, during which all of the facilities were explained. Subsequently, we moved to the Inawashiro lake side and attended a banquet at the Listel Inawashiro Hotel. The participants enjoyed dishes and liquors different from the previous day. On September 7, the third day of the conference, a plenary lecture, general lectures, and poster sessions were held before noon. In the afternoon, a city sightseeing tour was held. The participants visited Tsurugajo Castle (shown in Fig. 4) in Aizu-wakamatsu city. In 1965, Tsurugajo Castle was rebuilt in accordance with its original design. The castle symbolizes the samurai culture in Aizu-wakamatsu, which is the oldest town in Fukushima Prefecture. Ashina Naomori built "Higashi Kurokawa Yakata", the first castle building, in 1384. In 1593, Gamou Ujisato completed the rest of the castle and changed the name to "Tsurugajo". The stone wall, also completed at that time, remains as the foundation of the entire castle area, even 400 years later. Following the visit to the castle, participants enjoyed sake tasting at a sake museum. The sake museum was located only 5 minutes walk from Tsurugajo Castle. The museum is part of an old sake brewery where a noted local sake, Miyaizumi, is still produced today. Mannequins are used to show how sake was manufactured in the Edo period. In particular, the participants from Russia seemed to like this sake, the next Japanese participants could not follow them. In the evening, the conference dinner presented more lavish Japanese foods and a traditional performance of the "Byakkotai". The Byakkotai was a group of 19 samurai youths (all aged 16-17) who committed "hara-kiri", or ritual suicide, as they looked down at their castle from the top of Iimoriyama Hill. Upon seeing smoke rising from the castle, they presumed the castle was on fire and all was lost. The evening progressed to karaoke, Japanese-style singing performances, in which the slightly enthusiastic participants sang songs from their countries and grasped a microphone on the stage, tightening an Japanese sash of a yukata as a substitute for a cross brace. Yukata are informal, light cotton clothes worn in the summer. They are long robes that are folded across the front of the wearer and are fastened in the back at the waist by a sash called an

obi. Yukata are used for general relaxation and as sleepwear, and are commonly worn after bathing. On September 8, the final day of the conference, general lectures and poster sessions were held. In addition, a plenary lecture and closing ceremony were held. All events on the congress schedule were completed without difficulty.

The plenary lectures in the congress were as follows:

On the first day:

Terahertz Wave Imaging Technology (Professor Xi-Cheng Zhang)

On the third day:

Latest Development in Dynamic MRI of Multi-Phase Systems (Professor Lynn Gladden)

On the final day:

Optical Topography for Higher-order Brain-function Imaging and its Practical Applications (Professor Hideaki Koizumi)

3. Future World Congress

The next 5th WCIPT will be held in the city of Bergen, Norway, from September 3 to 6, 2007. Bergen is the most international city in Norway and has warmly welcome visitors for more than 900 years. Bergeners are proud of their city and of the city's traditions. There is much to see and enjoy whether you are visiting for the very first time, or are returning as so many do time after time. Modern Bergen is small by international standards, but it has always been a meeting place for people and a centre for commerce and culture. The congress chairpersons are Professor G. A. Johansen of the University of Bergen and Professor Hugh McCann of the University of Manchester, UK. Information about the 5th WCIPT is available at <<http://www.vcipt.org/>>.



Fig. 1. Call for papers.



Fig. 2. Conference venue OnYado Toho.



Fig. 3. Geisha performance.



Fig. 4. Tsurugajo castle.

Table 1. Number of Participants.

Country	Number	Country	Number
Australia	1	Korea	4
Austria	1	Netherlands	1
Belgium	1	Norway	6
Canada	3	Poland	9
China	7	Russia	6
Finland	4	Singapore	2
Germany	6	South Africa	2
India	1	Switzerland	1
Indonesia	1	UK	39
Iran	1	USA	8
Japan	66	Total	170

Table 2. Number of Lectures.

Category	Number
Tomographic Sensor Design	29
Industrial Application and Innovation	29
Process Modeling and Control	13
Chemical Reactor Engineering	17
Data Reconstruction and Fusion	34
Visualization and Image Analysis	23
Flow Imaging	23
Nuclear Engineering	6
Total	174



Fig. 5. Plenary lecture.



Fig. 6. Welcome party.



Fig. 7. Parallel session.



Fig. 8. City sightseeing.



Fig. 9. Poster session.



Fig. 10. Conference dinner.

Author Profile



Masahiro Takei: He received his M. Sc. (Eng) in Resource Engineering in 1991 from Waseda University, Tokyo, Japan. He also received his Ph. D. in Resource Engineering from Waseda University in 1995. He has worked in the Department of Mechanical Engineering, College of Science & Technology, Nihon University, Tokyo, Japan as an associate professor since 1995. His research interests include computed tomography, multiphase flow, image processing, and PIV.