Japan–Thailand Joint Seminar and International Symposium on Mechanical and Industrial Engineering between Muroran Institute of Technology and Chiang Mai University—MIER2012

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Abstract

A joint seminar that included an international symposium and several events sponsored by Muroran Institute of Technology in Japan and Chiang Mai University in Thailand was held in Hokkaido in January 2012. The title of the seminar and symposium was “Mechanical Engineering, Industrial Engineering, and Robotics, MIER2012.” The prime objectives are to foster young engineers and collaborate on research and education, focusing on the development of science and technology in Asia. The seminar was conducted over ten days and included the symposium, which lasted two days. The seminar program consisted of academic and cultural events, including the following: lectures, presentations, and discussions offered by both universities as part of the international symposium; the exchange of technological information and original ideas; visits to the facilities of local industries and the university’s laboratories; hands-on classes; study tours; homestays; and meetings. The students and professors of both universities actively exchanged their ideas and key information in English. This report briefly summarizes the activities of the seminar.

Keywords: International collaboration, Engineering education, Symposium, Hands-on classes, Students

1. Introduction

From the viewpoint of countermeasures required to address the rapid increase in globalization and the fast-paced development of science and technology, there is a great and immediate need to foster young engineers¹ with top-notch knowledge in their field and superior communication skills. Possible measures that would help meet these goals are initiating an exchange of international students on university campuses and participating in international conferences abroad. However, these possibilities are constrained by factors such as time and circumstances, the high hurdles for the acceptance of papers, and the prohibitive cost.

Muroran Institute of Technology (MuroranIT) has about thirty sister universities and institutes worldwide (http://www.muroran-it.ac.jp/oia/cir_en/exchange.html). One of the active universities among these is Chiang Mai University (CMU), with whom MuroranIT concluded an international exchange agreement in April 2005. A few years ago, CMU’s Department of Industrial Engineering offered to set up a collaboration related to mechanical engineering with MuroranIT’s Department of Mechanical Systems Engineering. In 2008, the department of MuroranIT began to promote an academic exchange with the CMU’s department. Also they aim to response to the globalization especially on the ASEAN University Network-Quality Assurance and Economic Community which will become the seemingly unavoidable needs for concern and attention. The two departments decided to hold a joint symposium based on their history of long-standing ties as sister universities and the similar academic fields that both departments share.

A few professors of both universities held a meeting to plan and discuss concrete ways to initiate an exchange and cooperation in the areas of research and education. One of their accomplishments is the first joint symposium that was held from November 22 to 23, 2010, at the Imperial Mae Ping in Chiang Mai, Thailand, also named TJIEME-CMU-MuroranIT-2010 (http://tjieme.eng.cmu.ac.th/). About fifty attendees participated in the symposium, including about thirty Thai students, professors, and engineers, and nineteen Japanese (nine students [two PhD candidates and seven MEng students], eight professors, and one researcher). The proceedings were distributed in the symposium and the selected papers were published in the special issue of Chiang Mai University Journal (http://cmuj.cmu.ac.th/). The Japanese students presented their papers as well as experienced Thai culture, history, life, and customs. The professors and students of MuroranIT and CMU participated enthusiastically in this joint meeting, and the students in particular benefited greatly.

According to the plans, the joint seminar would be held in Hokkaido for ten days, from January 9 to 18, and include the second international symposium from January 11 to 12. About sixty students and professors attended the symposium and plus tens of students joined various events conducted. The attendees comprised approximately forty students and professors mainly affiliated with the Mechanical Engineering Department of MuroranIT, and twenty...
students and professors mainly from CMU. The events included the seminar, which the symposium was a part of, study tours, hands-on classes, laboratory tours, industry excursions, and homestays. An outline of the seminar, the program of the symposium, and the various activities are presented in the report.

2. Preparation
The planning of the seminar began at a meeting related to the first symposium in 2010 in Chiang Mai. The formal preparation kicked into gear starting in the winter of 2011. Committees were organized to plan the seminar and symposium (the organizing committee members are listed in Appendix A). The committee consisted of five executive teams that focused on i) general affairs and the treasury, ii) papers and proceedings, iii) information and publicity, iv) events and exhibitions, and v) facilities and sites. In conjunction with this work the technical committee in-charge of reviewing the abstracts and papers, was organized. The executive members were selected from the faculty members in the Mechanical Engineering Department of MuroranIT, and each team staffed the chair positions. The committee also actively engaged the Center for International Relations of MuroranIT and the professors of CMU.

Homepages were opened (Fig. 1), and up-to-date information was punctually uploaded. In addition, the poster (Fig. 2) and the call for papers were distributed on the campus and to other institutions beyond the campus. Furthermore, risk and crisis management is very important; thus, the committee set up systems for emergency communication within the human network and devised an emergency telephone tree.

The organizing committee of MuroranIT held a total of sixteen meetings throughout the year. The corresponding professors of both universities emailed back and forth frequently, with the number of emails totaling about 350 from Japan to Thailand and about 150 from Thailand to Japan. The committee applied for a grant for both the Japan Student Service Organization (JASSO) and MuroranIT. Both applications were accepted, and the grants were fully implemented.

3. Seminar
The entire schedule of the seminar is shown in Appendix B.

—On the 1st day (January 9, Monday)
The seminar started on January 9 (a national holiday). A few Japanese participants were present at the New Chitose Airport to welcome the CMU attendees. After brief greetings, the Japanese and Thai participants proceeded to examine the airport’s air cooling system that runs by collecting snow to cool.

The Thai visitors were provided with accessories and clothes to protect against the cold, such as a watch coat, an arctic cap, and gloves. A chartered bus took the visitors to their accommodations in Muroran. During the bus trip, an in-house brochure was handed out that described in English all of the events related to the seminar, and pamphlets and maps detailing the venue were also distributed, which proved helpful for the Thai people. The Thai students checked in at the university guest house, and the professors at the city hotel with the Japanese members.

—On the 2nd day (January 10, Tuesday)
After the participants paid a courtesy visit to the university, the opening ceremony was held with the vice presidents, department heads, students, academic professors, and clerical staff in the morning. The luncheon, a tour of university facilities, and laboratory tours were conducted in the afternoon. During some spare time, a talk on the difference in customs between Thailand and Japan was given, such as bathing etiquette, which was believed to be very important in welcoming international people, especially for homestays.

—On the 3rd and 4th days (January 11 and 12, Wednesday and Thursday)
During these two days, the second joint symposium with CMU was held at the Noboribetsu Grand Hotel, which is located about forty minutes by road from MuroranIT. The opening address was followed by the distribution of the keynote lectures by two university professors from MuroranIT and CMU. The first lecture was entitled “CMU
Engineering and Sustainable Development” and the second was “An Aspect of Bioengineering—Optical Sensing and Imaging Techniques for Cosmetology and Dermatology”. Following this, about fifty presentations were delivered in two concurrent sessions (Appendix C). The 74% presenters were graduate students. The attendees were not only the graduate students and professors of the Industrial Engineering Department of CMU and the Mechanical Engineering Department of MuroranIT, but also the students, professors, and staff of other departments and a university. The presentations (about fifteen minutes) and discussion (about five minutes) were all given in English (Fig. 4).

On the evening of the 3rd and 4th day, respectively, a banquet was held in a room with Japanese decor and the seminar was held with mini-lectures on the history and culture of Hokkaido with a brief overview of the university. In addition, the students and professors exchanged academic and cultural viewpoints.

The symposium was a full-fledged academic meeting because it consisted of the organization and planning, a review process, a program, a conference bag (Fig. 5), a reception, a banquet, a homepage, posters, meal tickets, announcements, transportation, and the various sites. The symposium program is also uploaded on the website (http://www.muroran-it.ac.jp/mech/MIER2012/). The extended abstracts were received by email (mier2012@mme.muroran-it.ac.jp) and reviewed, and then bound in a proceedings book. The full papers were collected separately after the symposium, some of which will appear in a special section of Memoirs of the Muroran Institute of Technology after the review process takes place.

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**On the 5th day (January 13, Friday)**

The students and professors of CMU visited the heavy-industry shops of the Japan Steel Works in the morning, escorted by a few host professors. The CMU participants met and talked with the president of MuroranIT in the afternoon. In their free time, the attendees had a trial fitting of skis, ski boots, and ski wear at the University Hall for the following day’s events.

To experience the culture and lifestyle of the Japanese, the ten Thai students stayed in the homes of Japanese hosts for three nights, from the evening of January 13 (Friday) to the morning of January 16 (Monday). The students stayed separately in various Japanese homes. The families were kind enough to open their homes and provide meals on a voluntary basis. Before the seminar began, a survey was taken regarding allergies and special needs, and the information was sent to the host families. Further, Muroran city is less convenient in terms commuting to the town, so the host families and university staff helped the visitors travel to and from the campus every day.

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**On the 6th day (January 14, Saturday)**

The organizing committee planned two study tours: one was a ski lesson and the other a bus excursion. The ski lesson was held midday of the seminar at the Dan-para Snow Ball in Muroran. The Japanese students were asked to act as ski instructors for the Thai visitors. However, the weather conditions were not good owing to a blizzard, so visibility was poor and the temperature extremely low. Nevertheless, the guests enjoyed their first experience of skiing.

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**On the 7th day (January 15, Sunday)**

On Sunday, the Thai students spent the entire day with their host families. Many of them went shopping in a mall and sightseeing around the city. They experienced and enjoyed the Japanese daily life.

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**On the 8th day (January 16, Monday)**

All the Thai students and professors participated in a hands-on seminar on robotics at the Robot Arena, which is the university facility for robotics education. The Thai students and about thirty third-year Japanese undergraduate students interacted with each other and were divided into five groups, where each group consisted of two sub-groups. Each group made a robot using Lego Mindstorms blocks and parts, and programmed it with software. In the evening, a soccer competition was held using the robots they had made (Fig. 8).

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**On the 9th day (January 17, Tuesday)**

The Thai students, escorted by the host professors, went to Lake Toya by bus for an excursion as part of the second study tour. They also visited the Volcano Science Museum at Toya and a hands-on workshop of indigo dying (Fig. 9). In the evening, the Thai students and professors were asked to complete questionnaires. Finally, all the students and professors gathered for the closing ceremony and the farewell party.

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**On the 10th day (January 18, Wednesday)**

On the final day, the Thai students and professors checked out of the guest homes and the city hotels. The MuroranIT professors and students saw them off at the university front gate, and the guests flew back to Thailand.
4. Summary
The ten-day seminar that included an academic symposium and cultural events was held in Hokkaido. All the students were able to understand and recognize the importance of globalization and mutual support; they became aware of these fields or they became acquainted with more engineers and researchers. The Thai students learned about Japanese technology and education; they were immersed in Japanese culture and society, including mid-winter life in Hokkaido. The Japanese students directly interacted with international people who have a different culture and do not speak Japanese. It is expected that this experience will be valuable for both groups of students and prove beneficial for the professors in both countries. The other achievement of the seminar is to begin the faculty exchange collaboration.

The students, professors and host families were asked for their completed questionnaires. The responses and discussion will be presented in the next report. The third symposium will be held in Thailand in 2014.

5. Acknowledgments
The authors extend appreciation to the members of the advisory board and the committees, the staff of the Center for International Relations, and the students and academics of Chiang Mai University and the Muroran Institute of Technology. We are also grateful to the industrial companies, the local residents, and the host families. We would especially like to thank Professor Jomjunyong Sermkiat, Professor Smutkupt Uttapol, Professor Emeritus Toru Noguchi, Professor Hideki Kawai, Professor Kenya Kadosawa, and Mr. Shinya Miyashita for their thoughtful consideration and faithful cooperation. This project was supported by the Japan Student Service Organization (JASSO) and Muroran Institute of Technology in the 2011 academic year.

References

Appendix A: List of organizing committee members (2011)

| General chair | Professor Dr. Hideki Kawai |
| Secretary general | Professor Dr. Toshiharu Kazama |
| **Advisory board** |  |
| [MuroranIT] Professor Dr. Toru Noguchi, Professor Dr. Masashi Daimaruya, Professor Dr. Hiromitsu Hikita, Professor Dr. Ken-ichi Saitoh, Professor Dr. Masayoshi Kobiyama, Professor Dr. Osami Seri, Professor Dr. Tsutomu Saitoh, Professor Dr. Yoshihisa Aizu |
| [CMU] Professor Pakorn Adulbhan, Ph.D, Professor Voratas Kachitvichyanukul, Ph.D, Associate Professor Dr. Sermkiat Jomjunyong, Assistant Professor Nat Vorayos |

| **Organizing committee (Chair)** |  |
| [MuroranIT] Professor Dr. Hideki Kawai, Professor Dr. Toshiharu Kazama, Professor Dr. Hiroshi Nogami, Associate Professor Dr. Ikuo Tokura, Associate Professor Dr. Kenya Kadosawa, Associate Professor Dr. Hiroyuki Fujiki*, Associate Professor Dr. Naohiko Hanajima*, Associate Professor Dr. Tomonori Yuasa*, Associate Professor Dr. Koji Teramoto*, Lecturer Dr. Yasuhiro Osafune*, Lecturer Dr. Hiroki Matsumoto, Assistant Professor Mitsushi Yamashita, Assistant Professor Jun Suzuki, Assistant Professor Dr. Yukihito Narita, Assistant Professor Dr. Hideki Funamizu |
| [CMU] Associate Professor Wichai Chattinnawat, Ph.D, Assistant Professor Wassanai Wattanutchary, Ph.D, Dr. Worapod Sereerat, D.Eng, Dr. Chompoonoot Kasemset, D.Eng, Dr. Anirut Chaicharavanich, Ph.D, Dr. Wasawat Nakkiew, Ph.D |

| **Technical committee** |  |
| Professor Dr. Hiroshi Nogami, Professor Dr. Toshiharu Kazama, Associate Professor Dr. Ikuo Tokura, Associate Professor Dr. Hiroyuki Fujiki, Associate Professor Dr. Naohiko Hanajima, Associate Professor Dr. Tomonori Yuasa, Associate Professor Dr. Koji Teramoto, Lecturer Dr. Yasuhiro Osafune, Lecturer Dr. Hiroki Matsumoto, Assistant Professor Mitsushi Yamashita, Assistant Professor Jun Suzuki, Assistant Professor Dr. Yukihito Narita, Assistant Professor Dr. Hideki Funamizu, Associate Professor Wichai Chattinnawat, Ph.D |
### Appendix B: Seminar schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Jan. 9 (Mon)</th>
<th>Jan. 10 (Tue)</th>
<th>Jan. 11 (Wed)</th>
<th>Jan. 12 (Thu)</th>
<th>Jan. 13 (Fri)</th>
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<tr>
<td>8:00</td>
<td></td>
<td></td>
<td>9:00 Check-out</td>
<td>8:30 Check-out</td>
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<tr>
<td>9:00</td>
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<td></td>
<td>9:10-10:00</td>
<td>9:00-12:00</td>
<td>9:00-9:50</td>
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<td>10:00 (Flight)</td>
<td></td>
<td>9:30 Hotel -&gt; MloT</td>
<td>Hotel -&gt; Noboribetsu</td>
<td></td>
<td>Hotel -&gt; Muroran</td>
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<tr>
<td>10:00</td>
<td></td>
<td>10:00-12:00</td>
<td>Registration</td>
<td>Symposium 3</td>
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<tr>
<td>11:00</td>
<td></td>
<td>Opening ceremony</td>
<td>Symposium 1</td>
<td>-General session</td>
<td>Factory visit</td>
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<td>12:00-13:00</td>
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<td>14:00</td>
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<tr>
<td>15:00</td>
<td></td>
<td>Laboratory tour</td>
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<td>Symposia 2</td>
<td>Meeting</td>
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<tr>
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<td></td>
<td>in campus</td>
<td></td>
<td>-General session</td>
<td>Facility tour</td>
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<td>Orientation</td>
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<td>19:00</td>
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<td>20:00</td>
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### Appendix C: List of presented titles

J01) Numerical and Experimental Investigations of Fluidic Thrust Vectoring  
J02) Improvement of Efficiency and Torque Capacity of Shaft Drive CVT by Modification of Power Transmitting Path  
J03) Characteristics of Stress Distributions and Forming Omega Shape of Tubular Bellows by using Numerical Simulations  
J04) Stress Analysis of Compact Bone under Impact Loading  
J05) Mechanical Property Evaluation of Cartilage in Compression Test  
J06) Impact behavior of the Japanese Sword  
J07) Computations of Weak-Shock Attenuation due to Molecular Vibrational Relaxation  
J08) Development of a Viscosity-Controlled Hydrodynamic Journal Bearing  
J09) Development of the Sensor and Actuator Node Device for an Autonomous ATV
J10) Influence of Oil Temperature and Cavitation Number on Jet Cavitation Erosion for Hydraulic Equipment
J11) Humidity Effect on Flow Quality of Muroran IT Supersonic Wind Tunnel
J12) Preparation of MgAl2O4 Spinel Powder by Corrosion Reaction Synthesis
J13) Navigation of Car-like Robot by Path-Generating Regulator-Modification of the Control Law Coping with Steering Angle Saturation-
J14) Experimental Investigation of Machining Error in Elastomer Endmilling
J16) Local Blockage and Holdup of Fine Particles in Packed Bed
J17) Performance of Diesel Engine with Renewable Bio Fuel
J18) Rebound Vibration of the Internal Mirror Model of SLR Camera
J19) Proposal of Development Scheme for Novel Functional Prosthetic Hands
J20) Experiment on Frictional Characteristics of Toothbrushes
J21) High Accuracy Matching of Dot Cloud Data based on Refining Local Area
J22) In Vitro Evaluation of Friction and Wear Characteristics of Double Network Gel
J24) Experimental Study on Preventing Over Revolution of Propeller Type Wind Turbine
J25) Experimental Study on a Cross Flow Wind Turbine for Electric Vehicle
J26) Spectral Reflectance Properties of Multi-Layered Skin Tissue Phantom
J27) Frame-Rate Measurements of Blood Flow in Anesthetized Rat Using Laser Speckle Imaging
J28) Impact Strength of Bolted Steel Sheet for Car
J29) Immobilization Ability of the Photosynthesis Microorganism in a Taylor-Couette Vortex Flow
J30) Immobilization of the Photosynthesis Microorganism Using Polyethyleneimine-Coated BSP in a Taylor-Couette Vortex Flow
J32) Droplet Formation of Heating Medium Oil in Latent Heat Storage Bath
T01) Development of GABA Rice Snack by Product Design Techniques
T02) Preparation and Evaluation of Natural-Based Biomaterials for Bone Tissue Engineering
T03) Statistical Tolerance Synthesis for Minimizing Interrelated Multi-Responses of Deviations and Variation of Arm-Pivot-Flex-Assembly Hard Disk Actuator Using 3D Worst Case
T04) Investigating Design of Zero Acceptance Single Sampling Plans with Inspection Errors
T05) Fundamental Limits of Performance in Minimum-Time Motion Control due to Structural Flexibility
T06) Adaptive Output Feedback of Gait Training Robot for Neurological Injuries
T07) Reliability of the Knee Prosthesis for the Prostheses Foundation of H.R.H The Princess Mother
T08) Ergonomics Assessment of Rubber Sheet Production
T09) Fabrication of Microactuator for Dual-stage Slider in Hard Disk Drive based on Low Cost and High Resolution X-ray Lithography
T11) An Analysis of Thai Mango Supply Chain in Japan Market
T12) Efficiency Improvement Using Simulation Technique in Hard Disk Drive Cleaning Process
T13) Parameters Optimization for Reactive Ion Etching by Using Simulation Technique
T14) Physicochemical Properties of Cattle Bone based Hydroxyapatite for Bone Implant Deposited Using Electrostatic Spray Deposition
T15) A Suitable Electrostatic Coating Condition of Hydroxyapatite Powder Synthesized from Natural Based Material on AISI 316L Stainless Steel Substrate
T16) PSO for Bi-Level Programming: Additional Illustration in TOC Based Job-Shop Scheduling PSO for Bi-Level Programming
T17) An Application of Value Network Mapping in Workload Control Concept
T18) An Improvement of Blood Donation Queue by Using Simulation

Biography
Dr. Toshiharu Kazama is a professor in the College of Design and Manufacturing Technology, Graduate School of Engineering, Muroran Institute of Technology. At present, he is responsible for teaching the Mechanical Systems Engineering Course. He was the secretary general of the seminar.
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Dr. Koji Teramoto is an associate professor. He was the chair of the papers and proceedings.
Dr. Tomonori Yuasa is an associate professor. He was the chair of information and publicity.
Dr. Yasuhiro Osafune is a lecturer. He was the chair of the facilities and sites.
Dr. Hiroyuki Fujiki is a professor. He was the chair of the events and exhibitions.
Dr. Wichai Chattinnawat is an associate professor in the Department of Industrial Engineering, Faculty of Engineering, Chiang Mai University. He was the special person of contact for Chiang Mai University.