

**Program in Information and Management Systems (IMS)**  
**Graduate School of Comprehensive Scientific Research**  
**Prefectural University of Hiroshima (PUH)**



# Information on Graduate School

The Graduate School of Comprehensive Scientific Research in PUH consists of four Programs in Human Culture and Science, **Information and Management Systems**, Biological System Sciences, and Health and Welfare.

Hiroshima Campus



Shobara Campus

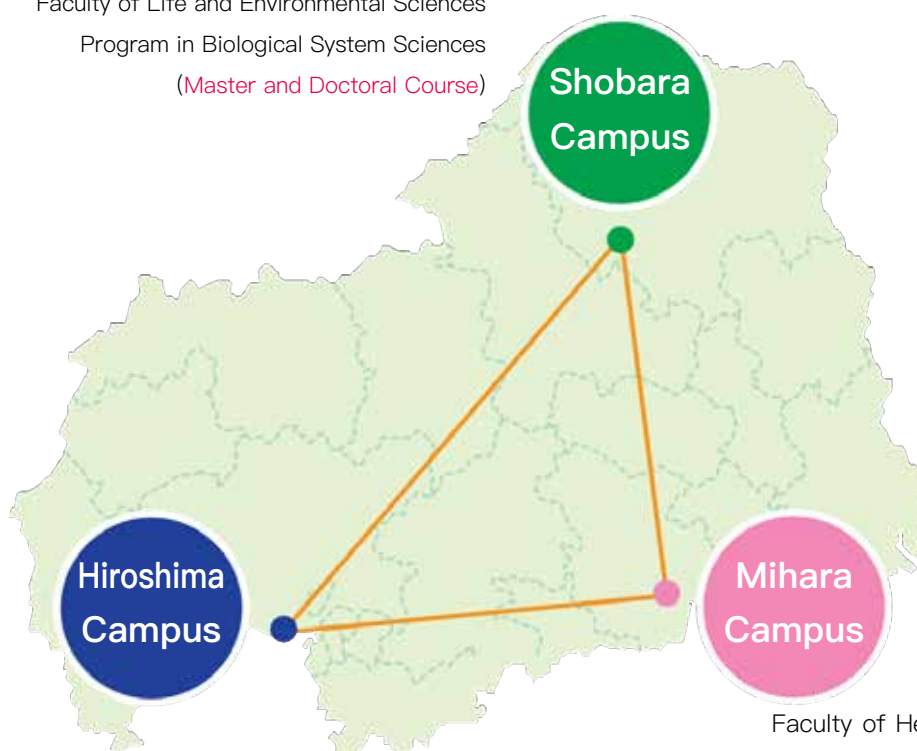


Mihara Campus



## Organization Map of Prefectural University of Hiroshima (PUH)

Faculty of Life and Environmental Sciences  
Program in Biological System Sciences  
(Master and Doctoral Course)



Faculty of Regional Development  
Program in Human Culture and Science (Master Course)

**Program in Information and Management Systems (IMS) (Master Course\*)**

\*In Sept. 2016, the graduate school launched a new program in IMS called English Track (ET) that all courses are taught in English and students are selected from universities which have signed an academic exchange agreements with PUH.

Faculty of Health and Welfare  
Program in Health and Welfare  
(Master and Doctoral Course)

# Information on Graduate School

## Educational philosophy/goals

- Our goal is to develop human resources who are “active in the local community” and “capable of functioning internationally” by equipping them with both a broad perspective and applied practical skills. Furthermore, we aim to enhance our ability to develop excellent scholars and high-level professionals, and to secure advanced educational opportunities for adults.
- Our goal is also to perform advanced research that is rooted in the local community and to share the successes with the community, while flexibly meeting the needs of society and the times.

## Ideal candidates

Persons who are interested in having a broad perspective and applied practical skills, being active in the local community, and attaining the ability to function internationally.

## Learning environment

We provide an environment that enables students to gain an advanced professional education. This includes performing practice exercises and experiments that emphasize small-group learning. Our learning environment fits the needs of working adults as well.

## Human resources development objective

Develop high-level professionals and scholars who can contribute to the community.

## Hiroshima Campus

**Program in Information and Management Systems (IMS)** (Master Course)



**Computing facility of IMS**



**Seminar studio of IMS**



# Important Information on IMS

## Educational philosophy/goals

- Developing human resources capable of taking the leadership in promoting high-grade social informatization, advanced corporate management, and R&D of related fields, by dividing information science and management into three fields, i.e., system science, social sciences, and corporate management, providing multidisciplinary curriculum, and pursuing graduate education with latest professional knowledge and world-level research.

## Ideal candidates

- Persons who are interested in the design, development, and operation of advanced information systems, including informatization strategy formulation and planning
- Persons who wish to create new industries and/or plan and promote new businesses
- Persons who are interested in solving problems faced by organizations (companies, governments, and various groups)

## Learning environment

### [Information systems]

Focuses on the research and practical implementation of problem-solving methodologies for information systems.

### [Information and social sciences]

Focuses on the research and practical implementation of problem-solving methodologies faced by modern society.

### [Corporate management]

Focuses on the research and practical implementation of problem-solving methodologies for companies, governments, NPOs, and other management organizations.

## Human resources development objective

1. Focusing on the latest information theories and management theories, as well as information science education and management science education.
2. Adopting a curriculum that is closely connected to undergraduate education to achieve dramatic improvement in problem-solving skills.
3. Disclosing research achievements in graduate school in an effort to feed back to the local community for its well-being.
4. Offering lectures and practical exercises to steadily improve students' practical skills and R&D capabilities.
5. The foreign students are welcomed.
6. The afternoon, evening, and Saturday classes are offered.
7. Long-term curriculum system is introduced.
8. The research guidance plan is introduced to carry out systematic supervision.

## Obtainable certificates/licenses

Specialized Certificate for High School Teachers (Business and Information)

# Faculty Members of IMS

Area	Research Theme	Name
Information Systems	<ul style="list-style-type: none"> <li>• Computational intelligence</li> <li>• Multimedia information systems</li> <li>• Database engineering</li> <li>• System engineering of information environmental systems</li> <li>• Processing of environmental information</li> <li>• Information security</li> <li>• Applied information systems</li> <li>• Adaptive systems</li> <li>• Information networks</li> <li>• Adaptive fuzzy control systems</li> </ul>	Takumi Ichimura Takeshi Uno Masayuki Okabe Hitoshi Ogawa Hisako Orimoto ★ Nobusuke Sasaki Tetsuya Shigeyasu ★ Yegui Xiao ★ Chunxiang Chen Hugang Han ★
Information and Social Sciences	<ul style="list-style-type: none"> <li>• Dynamical systems</li> <li>• Statistical modeling</li> <li>• Intelligent production systems</li> </ul>	Shinji Shigemaru Tetsuji Tonda Daisuke Hirotani
Corporate Management	<ul style="list-style-type: none"> <li>• Management accounting</li> <li>• Marketing</li> <li>• Accounting literacy</li> <li>• Financial accounting study</li> <li>• Strategic management</li> <li>• Finance</li> <li>• Applied economics</li> </ul>	Hiroshi Adachi Kouji Awashima Keita Kano Toru Hashigami Yousin Park Keiko Murakami Chisako Yamane

★ Supervisor of PhD students in Doctoral Program of Biological System Science of PUH.

# Research Topics in IMS

## Information Systems

### Prof. Takumi ICHIMURA – Computational Intelligence

E-mail: [ichimura@pu-hiroshima.ac.jp](mailto:ichimura@pu-hiroshima.ac.jp)

Deep Learning has the hierarchical network architecture to represent the complicated features of input patterns. The adaptive learning method that can discover the optimal network structure in Deep Learning realizes to construct the network structure with the number of hidden neurons and layers during learning phase. Moreover, the real world applications related to soft computing techniques such as neural networks, evolutionary computation, and swarm intelligence have been developed.

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### Assoc. Prof. Takeshi UNO – Multimedia Information Systems

E-mail: [uno@pu-hiroshima.ac.jp](mailto:uno@pu-hiroshima.ac.jp)

We research the visualization of information which uses multimedia, the development of Web applications, and operational experience using it for problem-solving.

For example, we developed “Programing Environment on Web for C Language Study Support” . Source description, compiling, and execution of C Language are possible on the Web regardless of the location, and also it enables you to record detailed study history data on a server. This data is utilized in the development of the system which provides feedback to students for a learning context in real time.

In addition, we also perform various new study on supporting systems using the Web and real-time sharing.

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### Assoc. Prof. Masayuki OKABE – Database Engineering

E-mail: [okabe@pu-hiroshima.ac.jp](mailto:okabe@pu-hiroshima.ac.jp)

We study the methodologies for developing intelligent and easy-to-use information systems and services using knowledge discovery techniques such as machine learning, data mining, and information retrieval. Research topics include semi-supervised learning algorithms, active sampling method for training data, outlier detection from stream data and context dependent information retrieval systems. Furthermore, we also study some relevant topics such as UI development for interactive data analysis and the application of human computation.

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### Prof. Hitoshi OGAWA – System Engineering of Information Environmental Systems

E-mail: [hogawa@pu-hiroshima.ac.jp](mailto:hogawa@pu-hiroshima.ac.jp)

Information environmental systems assisting human life and business should be harmonized with the surroundings including human and nature. It is necessary to depend on a multipronged approach to achieve this purpose. In this study, through designing and developing real information systems, their consistency, integrity, adaptability and influence on the environment are verified. The development method of new teaching materials for information education is also investigated.

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### Prof. Hisako ORIMOTO – Processing of Environmental Information

★ E-mail: [orimoto@pu-hiroshima.ac.jp](mailto:orimoto@pu-hiroshima.ac.jp)

Studies on evaluation and analysis of environment systems in noise canceling, recognition and discrimination by Bayes' theorem.

- 1) Application of air- and bone-conducted sounds to speech recognition technology
- 2) Application of throat sounds to chewing and swallowing discrimination
- 3) Application of higher-order correlation information to machine fault diagnosis

★ Supervisor of PhD students in Doctoral Program of Biological System Science of PUH.

# Research Topics in IMS

## Information Systems

### Assoc. Prof. Nobusuke SASAKI – Information Security

**E-mail: [sasaki@pu-hiroshima.ac.jp](mailto:sasaki@pu-hiroshima.ac.jp)**

The development of the information society has highlighted the importance of ensuring “information security”. We study mainly about Information Security technology and Information Security Management System. The main topics of our research are as follows:

- 1) The study of Information Security technology.
- 2) The development of education tools for learning Information Security technology and Information Security Management.
- 3) The study of game AI System.
- 4) The study of education tools using the gaming simulation.

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### Prof. Tetsuya SHIGEYASU – Applied Information Systems

**★ E-mail: [sigeyasu@pu-hiroshima.ac.jp](mailto:sigeyasu@pu-hiroshima.ac.jp)**

Recently, many kinds of portable computer devices with modules for broadband wireless access have been developed with the advancement of information and communications technologies. In parallel with the development, those devices have also established a wide variety of broad wireless networks.

In this study, fundamental and applied topics of the broadband wireless technology are considered. For example, as fundamental and applied topics, media access control protocols aiming for half duplex wireless communication network, and disaster information service systems employing broadband wireless network are considered, respectively.

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### Prof. Yegui XIAO – Adaptive Systems

**★ E-mail: [xiao@pu-hiroshima.ac.jp](mailto:xiao@pu-hiroshima.ac.jp)**

- 1) Active noise control (ANC) systems and applications in rotational machines, eco cars etc.: Implementation cost reduction and robust system development have been our focus in recent years.
- 2) Adaptive linear and nonlinear noise cancellers for speech signal enhancement. Adaptive algorithms and systems are our targets, that are capable of recovering the high-frequency components based on both air- and bone-conducted speech measurements.
- 3) Linear and nonlinear adaptive systems including advanced neural network based schemes for time-series analysis and prediction. Recently, we are focused on the development of new solar radiation / insolation prediction models.

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### Prof. Chunxiang CHEN – Information Networks

**E-mail: [chen@pu-hiroshima.ac.jp](mailto:chen@pu-hiroshima.ac.jp)**

As the Internet continues to grow as the infrastructure of communication systems, integrating sound, image, and movies; traffic control, which includes the error control, quality of service (QoS) and other factors are more important than ever due to the adoption of packet switching in the Internet. The main topics of our research are as follows (Fig. 1):

- Network management and operation
- New architecture and traffic engineering on the Internet of things (IoT)
- Error control and quality of service (QoS), etc.

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### Prof. Hugang HAN – Adaptive Fuzzy Control Systems

**★ E-mail: [hhan@pu-hiroshima.ac.jp](mailto:hhan@pu-hiroshima.ac.jp)**

There are two kinds of adaptive fuzzy control systems: one is using the fuzzy approximators to deal with unavailable functions in the system to be controlled and all the parameters involved in the control system are tuned by some adaptive laws; another is using the so-called T-S/polynomial fuzzy model representing the system to be controlled and the error between each local T-S/polynomial fuzzy model and the local system is treated by either the fuzzy approximator or observer with adaptive laws to tune related parameters. Our research interests include both the aforementioned adaptive control systems, particularly the latter since very few existing results on the approach are reported.

At the same time, we pay great attention to applications of the adaptive control systems proposed by us in order to verify their effectiveness and promote their applicableness.

# Research Topics in IMS

## Information and Social Sciences

### **Assoc. Prof. Shinji SHIGEMARU – Dynamical Systems**

**E-mail: shige@pu-hiroshima.ac.jp**

In general, it is difficult to describe a real system by the precise mathematical model and the model usually has uncertainties due to modeling errors, measurement errors, linearization approximations, and so on. Such uncertainties may cause instability of the system. Therefore, it is important to design some stabilizing controllers for the system with uncertainties. In our study, we develop some robust controllers for various types of uncertain dynamical systems. our research interests include large scale systems, robust control, adaptive control, and their applications.

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### **Prof. Tetsuji TONDA – Statistical Modeling**

**E-mail: ttetsuji@pu-hiroshima.ac.jp**

- 1) Longitudinal data analysis
- 2) Spatial data analysis
- 3) Exposure data analysis

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### **Assoc. Prof. Daisuke HIROTANI – Intelligent Production Systems**

**E-mail: dhiro@pu-hiroshima.ac.jp**

Recently, production systems become more bigger and more complex. My research focuses such a production system. Especially, JIT (Just In Time) production system, supply chain management, and cell manufacturing systems. In addition, I am also interested in production management and control. Especially, dynamic worker assignment method for cross-trained worker such as self-balancing production line (Bucket Brigades) . In the above-mentioned research, it can be applied for many industries.



# Research Topics in IMS

## Corporate Management

### **Prof. Hiroshi ADACHI – Management Accounting**

**E-mail: [adachi@pu-hiroshima.ac.jp](mailto:adachi@pu-hiroshima.ac.jp)**

Management accounting practices of small- and medium-sized enterprises

I theoretically examine the mechanisms that support management accounting practices in SMEs using case studies. Since the beginning of the 21st century, there has been increased attention to the study of SME management accounting, but the management accounting practiced there has not been distinguished qualitatively from that of large firms (Heinicke, 2018: 485). Considering this, I examine the “why” and “how” management accounting practices in SMEs mainly with semi-structured interview.

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### **Prof. Kouji AWASHIMA – Marketing**

**E-mail: [awashima@pu-hiroshima.ac.jp](mailto:awashima@pu-hiroshima.ac.jp)**

This study pays attention to Sales Force Management in Japanese enterprises. Sales sections exist as a key section in most Japanese enterprises. However, there are still not a lot of studies in Japan about this topic. In this study, I want to add a scientific insight to the essence of Sales Force Management., and present one solution to its various problems. Also, I am actively working on the regional brands in Hiroshima and the study on vitality of the shopping streets in recent years.

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### **Assitant Prof. Keita KANO – Accounting Literacy**

**E-mail: [kano0206@pu-hiroshima.ac.jp](mailto:kano0206@pu-hiroshima.ac.jp)**

The current research theme is the transformation of accounting practices and the evolving role of professional accountants brought about by digitalization. In recent years, digital technologies such as Artificial Intelligence (AI) have rapidly changed the business environment, and their impact has extended to small and medium-sized enterprises (SMEs) as well (e.g., Savić and Pavlović, 2023). However, it remains unclear how SME managers are actually utilizing digital technologies to improve business operations effectively and efficiently or to enhance performance. SMEs play a vital role in many national economies, contributing to job creation, innovation, and revitalization of regional economies. Nonetheless, they face challenges such as difficulties in securing funding, limited access to managerial resources, and intensifying competition. Within this context, the research focuses on identifying the factors driving the adoption of digital accounting technologies and examining their impact on business performance.

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### **Assoc. Prof. Toru HASHIGAMI – Financial Accounting Study**

**E-mail: [t-hashigami@pu-hiroshima.ac.jp](mailto:t-hashigami@pu-hiroshima.ac.jp)**

This study focuses on some modern topics regarding the financial accounting. The accounting system in Japan is dynamically changing and subject to International Financial Reporting Standards(IFRS) due to the agreement between Accounting Standards Board of Japan (ASBJ) and the International Accounting Standards Board(IASB). This study is composed of mainly 1) Study on the situation about the introduction of IFRS to Japan.,2) Study on new concepts of assets,liability ,income and so on.,3)Study on the importance of the cash flow statement under some situations where companies become insolvent.,4) Study on some advanced analyses of financial data.

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### **Prof. Yousin PARK – Strategic Management**

**E-mail: [ecventure@pu-hiroshima.ac.jp](mailto:ecventure@pu-hiroshima.ac.jp)**

My research has two themes. One is to examine whether horizontal division or vertical integration is more effective in business ecosystems. The second is to clarify inter-organizational relationships in the turnaround management of a Japanese electronics manufacturer from a group perspective.

Through social network analysis, we visualized Panasonic and Sony's group structure before and after their massive losses in 2011 and examined the dynamic changes in their turnaround strategies. The findings provide a new perspective for turnaround research and suggest the possibility of turnaround by reorganizing inter-organizational relationships in Japanese electronics manufacturers.

# Research Topics in IMS

## Corporate Management

**Prof. Keiko MURAKAMI – Finance**

**E-mail: [keikp@pu-hiroshima.ac.jp](mailto:keikp@pu-hiroshima.ac.jp)**

- 1) Financial Education and Household Financial Behavior
- 2) Life Insurance Education and behavior of Insurance Subscribers
- 3) Behavior of Defined Contribution Pension Plan's Participants
- 4) Governance of Corporate Defined Contribution Pension Plan
- 5) Japanese Corporate Pension Plans

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**Prof. Chisako YAMANE – Applied Economics**

**E-mail: [yamane@pu-hiroshima.ac.jp](mailto:yamane@pu-hiroshima.ac.jp)**

- 1) Birthweight and Intergenerational Disparities
  - 2) Motivation for Childbearing and Low Birth Rate
  - 3) Financial Behavior under Empathy and Social Influence
  - 4) Childhood Financial Experiences and Financial Literacy
  - 5) Financial Attitudes and Household Financial Behavior
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## Hiroshima Campus

### Program in Information and Management Systems

Address: 1-1-71 Ujina-Higashi, Minami-ku, Hiroshima City 734-8558

Tel: (082) 251-9540 Email: [puhnyusi@pu-hiroshima.ac.jp](mailto:puhnyusi@pu-hiroshima.ac.jp)

Website of Prefectural University of Hiroshima:

<http://www.pu-hiroshima.ac.jp/>



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