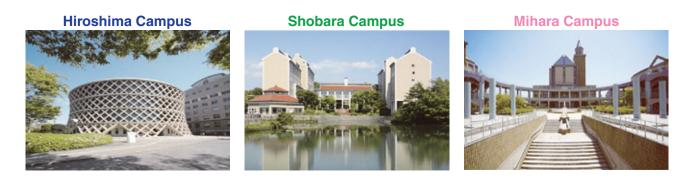Prefectural University of
Hiroshima

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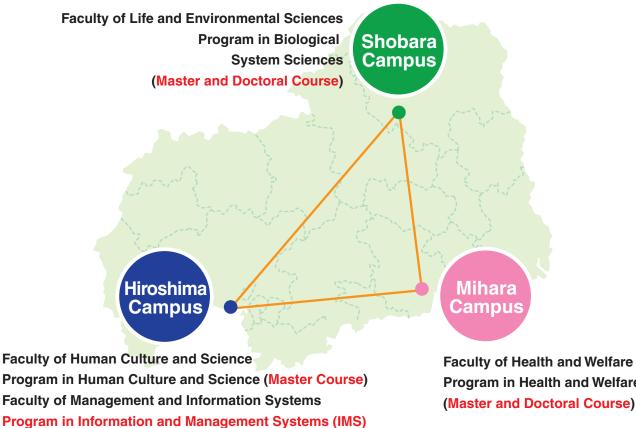# Prefectural University of Hiroshima (PUH)

2022

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**)

Shobara Campus

Hiroshima Campus

Mihara Campus

Faculty of Human Culture and Science
Program in Human Culture and Science (**Master Course**)
Faculty of Management and Information Systems
Program in Information and Management Systems (IMS)
(Master Course*)

Faculty of Health and Welfare
Program in Health and Welfare
(**Master and Doctoral 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.

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 leadership roles in promoting high-grade social informatization, advanced corporate management, and R&D of related fields, by applying information science to three fields, i.e., system science, social sciences, and corporate management, fusing together these three fields, 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)

Research fields composition

[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.

Educational features

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.

Human resources development objective

- Develop human resources who are work-ready and capable of taking on leadership roles in social informatization and organizational management.
- Develop human resources who have advanced information technology skills and management abilities that can meet the needs of society.
- In the field of Information Systems, develop human resources who can analyze, evaluate, design, develop, and operate advanced information systems.
- In the field of Information and Social Sciences, develop human resources who can scientifically engage in solving problems faced by modern society.
- In the field of Corporate Management, develop human resources who can engage in strategy formulation and planning in management organizations and can create and promote new industries and businesses.
- Develop human resources who can take on leadership roles in various fields of research and development.

Obtainable certificates/licenses

Specialized Certificate for High School Teachers (Business and Information)

Faculty Members of IMS

Area	Research Theme	Name
Information Systems	● Computational intelligence ● Multimedia information systems ● Database engineering ● System engineering of information environmental systems ● Processing of environmental information ● Information security ● Applied Information systems ● Adaptive systems ● Media information ● Information networks ● Adaptive fuzzy control systems	Takumi Ichimura Takeshi Uno Masayuki Okabe Hitoshi Ogawa Hisako Orimoto Nobusuke Sasaki Tetsuya Shigeyasu★ Yegui Xiao★ Jinhui Chen Chunxiang Chen Hugang Han★
Information and Social Sciences	● Dynamical systems ● Statistical modeling ● Intelligent production systems ● Regional management	Shinji Shigemaru Tetsuji Tonda Daisuke Hirotani Takashi Wada
Corporate Management	● Managerial accounting ● Marketing ● Management theory ● Financial system ● Financial accounting study ● Strategic management ● Global knowledge innovation management ● Finance ● Business model	Hiroshi Adachi Kouji Awashima Kumiko Obara Ichiro Tsukahara Toru Hashigami Yousin Park Minoru Hirano Keiko Murakami Toshihiro Yazawa

★ 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

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.

Assoc. Prof. Takeshi UNO —— Multimedia Information Systems
E-mail: 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.

Assoc. Prof. Masayuki OKABE —— Database Engineering
E-mail: 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.

Prof. Hitoshi OGAWA —— System Engineering of Information Environmental Systems
E-mail: 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.

Assoc. Prof. Hisako ORIMOTO —— Processing of Environmental Information
E-mail: orimoto@pu-hiroshima.ac.jp

The actual sound environment systems inevitably contain arbitrary noise distribution in the observation data. As a result, the evaluation and the analysis become difficult when judged in the field of environmental impact assessment. Then, the fuzzy adjustment filter to estimate the object signal is needed based on the fuzzy observation data, which is vague.

Assoc. Prof. Nobusuke SASAKI —— Information Security
E-mail: 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.

Information Systems

Prof. Tetsuya SHIGEYASU —— Applied Information Systems
★ **E-mail: 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.

Prof. Yegui XIAO —— Adaptive Systems
★ **E-mail: 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.

Assoc. Prof. Jinhui CHEN —— Media Information
E-mail: kinki@pu-hiroshima.ac.jp

Our Lab establishes primary research topic as Human-centric Artificial Intelligence in Media Information. It focuses on the research in image processing, computer vision, speech recognition, voice conversion, and human-robot interaction. The laboratory undertakes industry projects and solves real-world engineering problems. The main research interests includes:
a) Image processing, computer vision;
b) Speech and language processing;

Prof. Chunxiang CHEN —— Information Networks
E-mail: 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.

Prof. Hugang HAN —— Adaptive Fuzzy Control Systems
★ **E-mail: 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.

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

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.

Prof. Tetsuji TONDA —— Statistical Modeling
E-mail: ttetsuji@pu-hiroshima.ac.jp

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

Assoc. Prof. Daisuke HIROTANI —— Intelligent Production Systems
E-mail: dhiro@pu-hiroshima.ac.jp

Recently, production systems become more bigger and more comlex. My research focuses such a producrion 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 above-mentioned research, it can be applied for many industries.

Prof. Takashi WADA —— Regional Management
E-mail: t-wada1969@pu-hiroshima.ac.jp

In recent years, local governnance has been noted in the regional management field. Local governance is the regional management system where various actors, such as local municipalities, local enterprises, non-profit organizations and citizens, discuss and determine the policy of urban design and community development and run the projects in cooperation. I study the process and social network observed in local governance through case studies. My current research topics are as follows: 1) promotion of tourism using media contents such as film, animation and manga, 2) re-evaluation of traditional culture such as Kagura and use it for regional development, 3) use of the Internet by local municipalities, non-profit organizations and citizens for community development.

Corporate Management

Assoc. Prof. Hiroshi ADACHI —— Managerial Accounting
E-mail: adachi@pu-hiroshima.ac.jp

1) Market uncertainty and budgetary management
2) Japanese management accounting
3) Management accounting practices of small and medium-sized enterprises

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Prof. Kouji AWASHIMA —— Marketing
E-mail: 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. But 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.

Prof. Kumiko OBARA —— Management Theory
E-mail: obara@pu-hiroshima.ac.jp

- The Functions of the Executive
- Organization Theory
- Organizational Culture and Ethical Values
- Strategic Management and Structure Change
- Corporate Social Responsibility
- The Cultural Dimension of Global Management

Assoc. Prof. Ichiro TSUKAHARA —— Financial System
E-mail: i-tsukahara @pu-hiroshima.ac.jp

- Empirical Analysis of Household Financial Behavior
- Empirical Analysis of the Relationship among the Stock Prices
- The Role of the Financial Sector for Regional Economic Development

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Assoc. Prof. Toru HASHIGAMI —— Financial Accounting Study
E-mail: t-hashigami@pu-hiroshima.ac.jp

This study focuses on some modern topics regarding the finacial accounting. The accounting system in Japan is dynamically changing and subejct 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 situatins where companies become insolvent.,4) Study on some adovenced analyses of finacial data.

Corporate Management

Prof. Yousin PARK —— Strategic Management
E-mail: ecventure@pu-hiroshima.ac.jp

My research includes two topics. One is to examine whether the horizontal division or vertical integration is more effective in the business ecosystem. The other is to reveal the turnaround management of Japan's electronics manufacturers in the view of groups' inter-organizational relationships. By social network analysis, I have visualized and examined the group structures of Panasonic and Sony groups before and after the massive losses in 2011 and examined the dynamic changes of their turnaround strategies. My findings will provide an alternative view for turnaround study and suggest the possibility of turnaround through the reorganization of inter-organizational relationships for Japanese electronics manufacturers.

Prof. Minoru HIRANO —— Global Knowledge Innovation Management
E-mail: mhirano@pu-hiroshima.ac.jp

1) International Management and Knowledge Management
2) Strategic Alliances and International Joint Ventures
3) Research on Leaders and Leadership
4) Corporate Governance
5) Corporate Turnaround Management

Prof. Keiko MURAKAMI —— Finance
E-mail: keiko@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

Prof. Toshihiro YAZAWA —— Business Model
E-mail: tyazawa@pu-hiroshima.ac.jp

1) Business Model Development
2) Entrepreneurship Education
3) Project Management on Event and Festival
4) Management and Accounting on Film Industry
5) Business Planning

Master Theses (2021)

【Regular Track】

● A Study on Management Localization of Honda Motor Co., Ltd. in China

● Narrowband feedback active noise control system using adaptive linear prediction filter

● A Study on Current Status and Future Directions of Participation in Individual Defined Contribution Pension Plans: Focusing on the Younger Generation and Women

● A study on the role of management accounting in crisis: Based on a case study of a food and beverage company under the COVID-19 pandemic.

● A study on dynamic NON architecture for coping with network topology change induced by migration of contents publisher

● Time Series Classification using Mutual Information based Feature Extraction and Order Kernel

【ET（English Track）】

● A study on new DTN routing method for improving successfully message delivery under disaster situation

● A new facial expression recognition system using decision free and deep neural network

● Revised Worker Collaborative Models for Cellular Bucket Brigades with Discreate Work Stations

● A study on the Effectiveness of ECN with Fallback on the Internet

Hiroshima Campus

Program in Human Culture and Science
Program in Information and Management Systems

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