

List of research topics

as of February 17th, 2010

| No. | Research Area | Title of research (Give a www site for more information) | Name of Supervisor | Student | Limitati on of Accepta nce | Duration | Comments |
|---------------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------|-------------------------------------|------------------|------------------------------------------------------------------------------------------|
| Principles of Informatics Research Division | | | | | | | |
| 1 | Principles of Informatics | Automated Reasoning and Hypothesis Finding Techniques for Bioinformatics and Systems Biology http://research.nii.ac.jp/il/ | Prof. Katsumi INOUE (井上克巳教授) | Master and Ph. D students | 3 | 2 to 6 months | Basic knowledge on Artificial Intelligence and/or Computer Science is required. |
| 2 | Principles of Informatics | Abduction and Induction in (Multi-)Agent Systems http://research.nii.ac.jp/il/ | Prof. Katsumi INOUE (井上克巳教授) | Master and Ph. D students | | 2 to 6 months | |
| 3 | Principles of Informatics | Logic and Constraint Programming (including ASP, SAT, SMT and CSP) http://research.nii.ac.jp/il/ | Prof. Katsumi INOUE (井上克巳教授) | Master and Ph. D students | | 2 to 6 months | |
| 4 | Principles of Informatics | Graph Algorithm http://research.nii.ac.jp/~k_keniti | Prof. Ken-ichi KAWARABAYASHI (河原林教授) | Ph. D student | 1 | 2 months | |
| 5 | Principles of Informatics | Semantic Web / Linked Data http://www-kasm.nii.ac.jp/~takeda/index.html | Prof. Hideaki TAKEDA (武田教授) | Master and Ph. D students | 3 | 3 to 6 months | |
| 6 | Principles of Informatics | Social Web / Social Network Analysis http://www-kasm.nii.ac.jp/~takeda/index.html | Prof. Hideaki TAKEDA (武田教授) | Master and Ph. D students | | 3 to 6 months | |
| 7 | Principles of Informatics | Semantic Web for Academic Publication and Communication http://www-kasm.nii.ac.jp/~takeda/index.html | Prof. Hideaki TAKEDA (武田教授) | Master and Ph. D students | | 3 to 6 months | |

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| 8 | Principles of Informatics | Lambda-Calculus and Type Theory http://research.nii.ac.jp/~tatsuta/index-e.html | Prof. Makoto TATSUTA (龍田教授) | Master or Ph. D student | 1 | 2 to 6 months | It would be better to know lambda-calculus, type theory, or mathematical logic. |
| 9 | Principles of Informatics | Numerical linear algebra, numerical analysis http://research.nii.ac.jp/~hayami/index-e.html | Prof. Ken HAYAMI (速水教授) | Master or Ph. D students | 1 | 2 to 6 months | Basic knowledge in numerical linear algebra or numerical analysis is desirable. |
| 10 | Principles of Informatics | Ultra-Large Scale Sequence-Based Genome Informatics Toward Understanding of Bio-Diversity http://www.nii.ac.jp/en/faculty/fujiyama_asao/ http://www.nig.ac.jp/section/fujiyama/fujiyama-e.html | Prof. Asao FUJIYAMA (藤山教授) | Ph. D students | 2 | 2 to 6 months | |
| 11 | Knowledge Processing | Data mining methods for linked data http://ri-www.nii.ac.jp/ | Assoc. Prof. Ryutaro ICHISE (市瀬准教授) | Master and Ph. D students | 5 | 3 to 6 months | |
| 12 | Knowledge Processing | Machine learning methods for semantic integration http://ri-www.nii.ac.jp/ | Assoc. Prof. Ryutaro ICHISE (市瀬准教授) | Master and Ph. D students | | 3 to 6 months | |
| 13 | Principles of Informatics | Behavior Imitation on a Humanoid Robot http://www.iir.nii.ac.jp/index_e.html | Assoc. Prof. Tetsunari INAMURA (稲邑准教授) | Master and Ph. D students | 6 | 3 to 6 months | |
| 14 | Principles of Informatics | Intelligent tele-operation system for network robots http://www.iir.nii.ac.jp/index_e.html | Assoc. Prof. Tetsunari INAMURA (稲邑准教授) | Master and Ph. D students | | 3 to 6 months | |
| 15 | Principles of Informatics | Integration of Robot Simulation and Social Agent Simulation http://www.iir.nii.ac.jp/index_e.html | Assoc. Prof. Tetsunari INAMURA (稲邑准教授) | Master and Ph. D students | | 3 to 6 months | |

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| 16 | Complexity | Optimization algorithms with robustness guarantees (theoretical work, theorem proving) http://research.nii.ac.jp/~uno/index.html | Assoc. Prof. Takeaki UNO (宇野准教授) | Ph. D student | 1 | 2 to 6 months | |
| 17 | Formal Language Theory | Open Problems on Multiple Context-Free Grammars and Related Formalisms http://research.nii.ac.jp/~kanazawa/ | Assoc. Prof. Makoto KANAZAWA (金沢准教授) | Master and Ph. D students | 2 | 3 to 6 months | ※Reference 1 |
| 18 | Principles of Informatics | Domain based text mining and knowledge acquisition http://sites.google.com/site/nhcollier/ | Assoc. Prof. Nigel COLLIER (コリアー准教授) | Master and Ph. D students | 4 | 2 to 6 months | |
| 19 | Principles of Informatics | Social Web analysis using natural language processing http://sites.google.com/site/nhcollier/ | Assoc. Prof. Nigel COLLIER (コリアー准教授) | Master and Ph. D students | | 2 to 6 months | |
| 20 | Principles of Informatics | Geo-spatial visualization of natural language data http://sites.google.com/site/nhcollier/ | Assoc. Prof. Nigel COLLIER (コリアー准教授) | Master and Ph. D students | | 2 to 6 months | |
| 21 | Quantum computation and communication | Computer architecture for quantum information processing www.qis.ex.nii.ac.jp | Assoc. Prof. Kae NEMOTO (根本准教授) | Master and Ph. D students | 2 | 2 to 6 months | |
| 22 | Quantum computation and communication | Quantum devices www.qis.ex.nii.ac.jp | Assoc. Prof. Kae NEMOTO (根本准教授) | Master and Ph. D students | | 2 to 6 months | |

Information Systems Architecture Science Research Division

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| 23 | Software Engineering | Bidirectional Model Transformation for Software Development http://www.biglab.org/ | Prof. Zhenjiang HU (胡教授) | Master and Ph. D students | 2 | 2 to 6 months | |
| 24 | Parallel Programming | High-level Parallel Programming for Multicore Architecture http://research.nii.ac.jp/~hu/project/skepara.html | Prof. Zhenjiang HU (胡教授) | Master and Ph. D students | | 2 to 6 months | |

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| 25 | Dependable Software Engineering | Modeling with Algebraic Specification Language http://researchmap.jp/nkjm | Prof. Shin NAKAJIMA (中島教授) | Master and Ph. D students | 2 | 3 to 6 months | Please send email to this supervisor before your application at your institute. |
| 26 | Dependable Software Engineering | Model Checking C Programs http://researchmap.jp/nkjm | Prof. Shin NAKAJIMA (中島教授) | Ph. D students | | 3 to 6 months | |
| 27 | Dependable Software Engineering | Software Development with Event-B http://researchmap.jp/nkjm | Prof. Shin NAKAJIMA (中島教授) | Ph. D students | | 3 to 6 months | |
| 28 | Dependable Software Engineering | Case Studies on Model Checking Web Applications http://researchmap.jp/nkjm | Prof. Shin NAKAJIMA (中島教授) | Master and Ph. D Students | 2 | 3 to 6 months (6 months preferabl) | |
| 29 | Information Systems Architecture | Poplar: Dynamic assembly of software components using protocol and state information http://www.monomorphic.org/poplar/ | Prof. Shinich HONIDEN (本位田教授) | Ph. D students | 2 | 2 to 6 months | ※Reference 2 |
| 30 | Information Systems Architecture | Autonomic Management of Wireless Sensor Network http://xac-project.jp/about/internship_e.html | Prof. Shinich HONIDEN (本位田教授) | Ph. D students | 2 | 2 to 6 months | Experience and interest in wireless sensor networks. For more detailed information about this internship, please see the site below. http://xac-project.jp/about/internship_e.html |

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| 31 | Information Systems Architecture | Multi-Agent Planning and Scheduling for Smart Technical Systems http://homepages.uni-paderborn.de/kloepper/SmartSystems.htm | Prof. Shinich HONIDEN (本位田教授) | Master and Ph. D student | 2 | 2 to 6 months | ※Reference 3 |
| 32 | Information Systems Architecture | Software Testing in the Context of Small Mobile Applications http://honiden-lab.ex.nii.ac.jp/~eric/doku.php?id=internships | Prof. Shinich HONIDEN (本位田教授) | Master and Ph. D, preference for Master | 2 | 3 to 6 months depending on the skills of the candidate | ※Reference 4 |
| 33 | Communication Networks | Resource management and QoS control in broadband wireless networks http://research.nii.ac.jp/~kei/ | Assoc. Prof. Yusheng JI (計准教授) | Master and Ph. D student | 3 | 3 or 6 months | |
| 34 | Communication Networks | Cross-layer design for wireless ad hoc and sensor networks http://research.nii.ac.jp/~kei/ | Assoc. Prof. Yusheng JI (計准教授) | | | 3 or 6 months | |
| 35 | Computer network | Measurement and analysis of Internet traffic http://www.fukuda-lab.org/en/research.html | Assoc. Prof. Kensuke FUKUDA (福田准教授) | Master and Ph. D student | 2 | 4 to 6 months | Solid programming skills in C or C++ |
| 36 | Constraint Programming | Theory and Practice of Constraint Programming http://www.informaticians.org/hosobe/intern.html | Assoc. Prof. Hiroshi HOSOBÉ (細部准教授) | Master and Ph. D student | 2 | 2 to 6 months | |
| 37 | Interconnection Networks | Low-power interconnects in multi-processor systems http://research.nii.ac.jp/~koibuchi | Assoc. Prof. Michihiro KOIBUCHI (鯉渕准教授) | Ph. D students | 2 | 2 to 6 months | |

Digital Content and Media Sciences Research Division

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| 38 | Digital Content and Media Sciences | video and image semantic analysis and classification using local features (esp. TRECVID HLF task. see: http://www-nlpir.nist.gov/projects/trecvid/) | Prof. Shin'ichi SATOH (佐藤真一教授) | Master and Ph. D (Ph. D preferable) | 5 | more than 90 days | |
| 39 | Digital Content and Media Sciences | identification of specific object in video and image esp. TRECVID instance search. see: http://www-nlpir.nist.gov/projects/trecvid/ | Prof. Shin'ichi SATOH (佐藤真一教授) | Master and Ph. D (Ph. D preferable) | | more than 90 days | |
| 40 | Digital Content and Media Sciences | "Beyond Content Based Copy Detection," explore potential video mining applications | Prof. Shin'ichi SATOH (佐藤真一教授) | Master and Ph. D (Ph. D preferable) | | more than 90 days | |
| 41 | Digital Content and Media Sciences | Event detection and action recognition (esp. TRECVID event detection task. see: http://www-nlpir.nist.gov/projects/trecvid/) | Prof. Shin'ichi SATOH (佐藤真一教授) | Master and Ph. D (Ph. D preferable) | | more than 90 days | |
| 42 | Digital Content and Media Sciences | Face Orientation Quantification for Face Sequence Indexing and Matching | Prof. Shin'ichi SATOH (佐藤真一教授) | Master and Ph. D (Ph. D preferable) | | more than 90 days | |
| 43 | Digital Content and Media Sciences | video search | Prof. Shin'ichi SATOH (佐藤真一教授) | Master and Ph. D (Ph. D preferable) | | more than 90 days | |
| 44 | Digital Content and Media Sciences | Text stream mining based on latent topic models http://www.ldear.nii.ac.jp/~takasu/en/index.php | Prof. Atsuhiko TAKASU (高須教授) | Master and Ph. D students | 2 | 2 to 6 months | |
| 45 | Digital Content and Media Sciences | Machine learning approach to recommender systems http://www.ldear.nii.ac.jp/~takasu/en/index.php | Prof. Atsuhiko TAKASU (高須教授) | Master and Ph. D students | | 2 to 6 months | |

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| 46 | Computer vision | One of the following topics. -3D Object modeling using a range scanner -Recognizing human activities from video - Scene categorization and event recognition for 3D scene modeling http://research.nii.ac.jp/~sugimoto/ | Prof. Akihiro SUGIMOTO (杉本教授) | Ph. D students | 4 | Up to 6 months (at least 3 months; a longer period is better) | Rigorous background on mathematics is required. In particular, sufficient knowledge of linear algebra, graph theory and number theory are important requirements. Programming skills on image processing or computer vision are also required. |
| 47 | Mathematical engineering | -Geometric computing theory for integer points http://research.nii.ac.jp/~sugimoto/ | Prof. Akihiro SUGIMOTO (杉本教授) | Ph. D students | | Up to 6 months (at least 3 months) | |
| 48 | Digital Content and Media Sciences | text-based communication / analysis and mining of textual corpora http://www-al.nii.ac.jp/en/ | Prof. Akiko AIZAWA (相澤教授) | Master or Ph. D students | 1 | more than 90 days | Basic programming skills preferable |
| 49 | Digital Content and Media Sciences | Fundamental techniques and systems for media security http://research.nii.ac.jp/~iechizen/official/content_e.html | Assoc. Prof. Isao ECHIZEN (越前准教授) | Ph. D students | 3 | 3 to 6 months | |
| 50 | Digital Content and Media Sciences | Privacy in e-Health http://research.nii.ac.jp/~iechizen/official/content_e.html http://research.nii.ac.jp/~iechizen/official/content_e_sven.html | Assoc. Prof. Isao ECHIZEN (越前准教授) | Ph. D students | | 3 to 6 months | |
| 51 | Digital Content and Media Sciences | Digital live forensics http://research.nii.ac.jp/~iechizen/official/content_e.html https://sites.google.com/site/savolabs/ | Assoc. Prof. Isao ECHIZEN (越前准教授) | Ph. D students | | 3 to 6 months | |

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| 52 | Database Application | Emergency information systems for meteorology and disaster reduction http://agora.ex.nii.ac.jp/~kitamoto/education/internship/ | Assoc. Prof. Asanobu KITAMOTO (北本准教授) | Ph. D preferred but also master | No limitation | 2 to 6 months | |
| 53 | Earth Environment | Earth environmental informatics for agriculture, biodiversity and climate change http://agora.ex.nii.ac.jp/~kitamoto/education/internship/ | Assoc. Prof. Asanobu KITAMOTO (北本准教授) | Ph. D preferred but also master | | 2 to 6 months | |
| 54 | Digital Archives | Cultural heritage informatics for geographic information, 3D modeling and multilingual processing http://agora.ex.nii.ac.jp/~kitamoto/education/internship/ | Assoc. Prof. Asanobu KITAMOTO (北本准教授) | Ph. D preferred but also master | | 2 to 6 months | |
| 55 | Image Analysis | Content-based image retrieval and biological image analysis http://agora.ex.nii.ac.jp/~kitamoto/education/internship/ | Assoc. Prof. Asanobu KITAMOTO (北本准教授) | Ph. D preferred but also master | | 2 to 6 months | |
| 56 | Digital Contents and Media Sciences | Computational Photography (Image-based rendering, Image processing) http://research.nii.ac.jp/~imarik | Assoc. Prof. Imari SATO (佐藤いまり准教授) | Master and Ph. D students | 2 | 5 to 6 months | |

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| 57 | Digital Content and Media Sciences | R&D in the Foundations of the 3D Internet(open source OpenSim world simulator) http://www.prendingerlab.net/globalab/ | Assoc. Prof. Helmut PRENDINGER (プレンドインガー 准教授) | Master and Ph. D students | 9 | 3-6 months | Solid programming skills required (e.g. Java, C++, or C Sharp) but no specific background assumed. Longer stay preferred for good result (running software and publication) |
| 58 | Digital Content and Media Sciences | Participatory Science / Collaborative Visualization and Simulation in the 3D Internet (Ambient Intelligence, Social Mobile Networks, Bio and Environmental Sciences, Agriculture, Health Training, Astrophysics) http://www.prendingerlab.net/globalab/ | Assoc. Prof. Helmut PRENDINGER (プレンドインガー 准教授) | Master and Ph. D students | | 3-6 months | |
| 59 | Digital Content and Media Sciences | OpenEnergySim: an open source platform for exploring "Green Transport" in the OpenSim virtual world (immersive driving with game wheel, traffic simulation, CO2 emission simulation, collaborative evaluation framework, modeling driver behavior) http://www.prendingerlab.net/globalab/ | Assoc. Prof. Helmut PRENDINGER (プレンドインガー 准教授) | Master and Ph. D students | | 3-6 months | |
| 60 | Digital Content and Media Sciences | Quality-Assured Web/Ambient Services Composition and Delivery http://research.nii.ac.jp/~f-ishikawa/internships/ | Assist. Prof. Fuyuki ISHIKAWA (石川助教) | Master and Ph. D students | 3 | 2 to 6 months | |
| 61 | Digital Content and Media Sciences | Tool Development for Formal Specification Methods http://research.nii.ac.jp/~f-ishikawa/internships/ | Assist. Prof. Fuyuki ISHIKAWA (石川助教) | Master and Ph. D students | | 2 to 6 months | |
| 62 | Digital Content and Media Sciences | Modeling and Analysis of Legal Interpretation for Requirements Engineering http://research.nii.ac.jp/~f-ishikawa/internships/ | Assist. Prof. Fuyuki ISHIKAWA (石川助教) | Master and Ph. D students | | 2 to 6 months | |
| 63 | Human Interaction | Understanding Multiparty Interaction http://research.nii.ac.jp/~bono/indexE.html | Assist. Prof. Mayumi BONO (坊農助教) | Master and Ph. D students | 3 | 2 to 6 months | |

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| 64 | Information and Society | Consumer behavior analysis of e-commerce & e-money http://researchmap.jp/hokada/english/ | Assoc. Prof. Hitoshi OKADA (岡田准教授) | Master and Ph. D students | 2 | 2 to 6 months | |
| 65 | Information Public Policy. | Public Policy Issues on IPTV, Broadband, Network Economics, and Open Source Software. | Assist. Prof. Masashi UEDA (上田助教) | Master and Ph. D students | 2 | Up to 6 months | I welcome both natural and social science background students. |

Collaborative Research Division

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| 66 | Collaborative Research Division | Correlation-based Outlier Detection http://research.nii.ac.jp/~meh/internship/intern-project-outlier.doc | Visiting Prof. Michael HOULE (フル客員教授) | Master and Ph. D students | 7 | 5 to 6 months | |
| 67 | Collaborative Research Division | Unsupervised Feature Selection http://research.nii.ac.jp/~meh/internship/intern-project-features.doc | Visiting Prof. Michael HOULE (フル客員教授) | Master and Ph. D students | | 5 to 6 months | |
| 68 | Collaborative Research Division | Cache-based Query Result Estimation http://research.nii.ac.jp/~meh/internship/intern-project-cache.doc | Visiting Prof. Michael HOULE (フル客員教授) | Master and Ph. D students | | 5 to 6 months | |
| 69 | Collaborative Research Division | Dynamic Query-Result Clustering http://research.nii.ac.jp/~meh/internship/intern-project-qclust.doc | Visiting Prof. Michael HOULE (フル客員教授) | Master and Ph. D students | | 5 to 6 months | |
| 70 | Collaborative Research Division | Distributed Data Clustering http://research.nii.ac.jp/~meh/internship/intern-project-pclust.doc | Visiting Prof. Michael HOULE (フル客員教授) | Master and Ph. D students | | 5 to 6 months | |
| 71 | Collaborative Research Division | Multimodal Data Clustering http://research.nii.ac.jp/~meh/internship/intern-project-morsc.doc | Visiting Prof. Michael HOULE (フル客員教授) | Master and Ph. D students | | 5 to 6 months | |
| 72 | Collaborative Research Division | Rank-based Similarity Search http://research.nii.ac.jp/~meh/internship/intern-project-simsearch.doc | Visiting Prof. Michael HOULE (フル客員教授) | Master and Ph. D students | | 5 to 6 months | |

※ Reference

1. (Topic No. 17) Candidates should have mastered the basics of automata theory and be mathematically mature enough to be able to prove new results on their own. See my recent publications and lecture notes for the course “Mathematical Linguistics”, available on my web site, for examples of research on this topic.
2. (Topic No. 29) Requirements: The ideal candidate will have strong knowledge of Java or C#, and knowledge of the Scala language would be a plus. Furthermore, interest in programming languages or software engineering is required. Industrial experience, experience of large scale software development, automata theory, type systems are all beneficial.
3. (Topic No.31) Requirements: The candidate should be experienced in object oriented programming (Java, C++, C#, etc.). Previous experiences in multi-agent systems or computational intelligence (e.g. data mining, multi-objective optimization, search algorithms) or scheduling are highly welcome.
4. (Topic No.32) The internship requires the following skills:
 - Analytical skills: We will conduct surveys on testings and report on several aspects. Basic statistical analysis will be needed.
 - Programming languages: Either or both of the two groups:
 - C/C++/Objective-C and SmallTalk
 - Java
 - Experience in studying APIs and technical documents.
 - Good command in English (Japanese language is a plus, but not required).
 - Knowledge about the iPhone SDK and/or Android SDK is a significant plus.
 - 3 months minimum. Up to 6 months depending on candidates' skills.