List of Research topics for 2012 1st call

as of Mar.5, 2012

No.	Research Area	Title of the research (Website for more information)	Name of Supervisor	Requirements for applicants:Master/Ph. D. Student	Numbers of acceptance	Duration : 2-6months(60-180 days)	Comments
1. Principles of Informatics Research Division							
1	Principles of Informatics	Lambda-Calculus and Type Theory http://research.nii.ac.jp/~tatsuta/index-e.html	Professor Makoto Tatsuta	Master's or Ph.D. Student	1	2-6 months	It would be better to know lambda-calculus, type theory, or mathematical logic.
2	Web Informatics	Semantic Web / Linked Data http://www-kasm.nii.ac.jp/~takeda/index.html	Professor Hideaki Takeda	Master's or Ph.D. Student	3	3-6 months	
3	Web Informatics	Social Web / Social Network Analysis http://www-kasm.nii.ac.jp/~takeda/index.html	Professor Hideaki Takeda	Master's or Ph.D. Student		3-6 months	
4	Web Informatics	Semantic Web for Academic Publication, Library and Museum http://www-kasm.nii.ac.jp/~takeda/index.html	Professor Hideaki Takeda	Master's or Ph.D. Student		3-6 months	
5	Data Structures	Advanced Data Structures http://researchmap.jp/sada	Assoc. Professor Kunihiro Sadakane	Ph.D. Student	2	3-6 months	Basic knowlodge of algorithms and data structures is required.
6	Artificial Intelligence / Systems Biology	Inference and Learning for Systems Biology and Network Dynamics http://research.nii.ac.jp/il/	Professor Katsumi Inoue	Master's or Ph.D. Student	2	3-6 months	Basic knowledge of Artificial Intelligence, Bioinformatics or Network Science is required. Contact Prof. Inoue in advance.
7	Knowledge Representation / Logic Programming	Answer Set Programming, Constraint Programming, and Satisfiability http://research.nii.ac.jp/il/	Professor Katsumi Inoue	Master's or Ph.D. Student		3-6 months	Basic knowledge of Logic and/or Computer Programming is required. Contact Prof. Inoue in advance.

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8	Knowledge Processing	Data mining methods for large scale data http://ri-www.nii.ac.jp/	Assoc. Professor Ryutaro Ichise	Master's or Ph.D. Student	4	4-6 months	
9	Knowledge Processing	Machine learning methods for semantic integration http://ri-www.nii.ac.jp/	Assoc. Professor Ryutaro Ichise	Master's or Ph.D. Student		4-6 months	
10	Knowledge Processing	Data integration methods for linked data http://ri-www.nii.ac.jp/	Assoc. Professor Ryutaro Ichise	Master's or Ph.D. Student		4-6 months	
11	Numerical linear algebra, Numerical analysis	Iterative solution of least squares problems, systems of equations and its application to ill-posed problems http://researchmap.jp/KenHayami/?lang=english	Professor Ken Hayami	Ph.D. Student	1	2-6 months	Basic knowledge of linear algebra and numerical analysis is required.
12	Numerical linear algebra, Numerical analysis	Solution of under-determined inverse problems and its application to pharmacokinetics etc. http://researchmap.jp/KenHayami/?lang=english	Professor Ken Hayami	Ph.D. Student	1	2-6 months	Basic knowledge of linear algebra and numerical analysis is required.
13	juris-informatics	logical analysis of legal reasoning (URL for related papers http://research.nii.ac.jp/~ksatoh/juris-informatics-papers/)	Professor Ken Satoh	Ph.D. Student	1	2-6 months	
14	juris-informatics	information extraction from legal texts (URL for related papers http://research.nii.ac.jp/~ksatoh/juris-informatics-papers/)	Professor Ken Satoh	Ph.D. Student	1	2-6 months	
15	acoustic signal processing	Source separation and localization based on asynchrous recordings http://research.nii.ac.jp/~onono/index-e.html	Assoc. Professor Nobutaka Ono	Master's or Ph.D. Student	1	2-6 months	Basic knowledge of signal processing and programming skill on Matlab are required.
16	acoustic signal processing	Speech enhancement with fluctuation-length filtering http://research.nii.ac.jp/~onono/index-e.html	Assoc. Professor Nobutaka Ono	Master's or Ph.D. Student	1	2-6 months	Basic knowledge of signal processing and programming skill on Matlab are required.
17	acoustic signal processing	Spectrogram-based audio coding http://research.nii.ac.jp/~onono/index-e.html	Assoc. Professor Nobutaka Ono	Master's or Ph.D. Student	1	2-6 months	Basic knowledge of signal processing and programming skill on Matlab are required.

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18	Formal Language Theory	Open Problems on Multiple Context-Free Grammars and Related Formalisms http://research.nii.ac.jp/~kanazawa/FormalGrammar/index.html http://research.nii.ac.jp/~kanazawa/mcfgplus2.html http://research.nii.ac.jp/~kanazawa/publications/index.html	Assoc. Professor Makoto Kanazawa	Master's or Ph.D. Student	2	3–6 months	Candidates should have mastered the basics of automata and computability theory and be mathematically mature enough to be able to tackle open problems. See my recent publications and lecture notes "Formal Grammar: An Introduction", available on my web site, for examples of research on this topic.
19	Computational Linguistics	Implementing Natural Language Semantics with Functional Programming http://research.nii.ac.jp/~kanazawa/Courses/2011/Seminar/index.html	Assoc. Professor Makoto Kanazawa	Master's or Ph.D. Student	2	3–6 months	Candidates should have rudimentary knowledge of natural language semantics, as found in, e.g., Heim and Kratzer's textbook. Previous experience with at least one programming language (not necessarily functional) is required.
20	Communication & networking	Title: Congestion control in Opportunistic networks http://researchmap.jp/shigeki/?lang=english	Professor Shigeki Yamada	Master's or Ph.D. Student	1	2-6 months	Congestion control in Opportunistic networks The opportunistic network, considered as a subclass of Delay Tolerant Networks (DTN), is a network with intermittent connectivity. This intermittency in communication is due to mobility nature of nodes in the network. So, nodes in opportunistic network follow a store-carry-forwards paradigm and rely on suitable opportunity for communication. Most of the proposed routing protocols work well under the assumption of unlimited buffer which is not practical. Moreover, due to diverse applications of this kind of network in smaller devices and rapid growth in volume of data, congestion control and avoidance have become a significant issue which requires much more research efforts. Hence, congestion control or avoidance in opportunistic network is further challenging due to nature of this kind of network. In that consequence, we are focusing our research efforts for a flexible congestion control scheme that can align with real world characteristics of opportunistic network.

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21	Quantum computation and communication	Computer architecture for quantum information processing http://www.qis.ex.nii.ac.jp	Professor Kae Nemoto	Master's or Ph.D. Student	2	2-6 months	
22	Quantum computation and communication	Quantum devices http://www.qis.ex.nii.ac.jp	Professor Kae Nemoto	Master's or Ph.D. Student		2-6 months	
23	Intelligent robotics	Behavior Imitation on a Humanoid Robot http://web.iir.nii.ac.jp/lab/english/research/mimesis/	Assoc. Professor Tetsunari Inamura	Master's or Ph.D. Student	3	3-6 months	Requred skill: writing software in C++
24	Intelligent robotics	Intelligent tele-operation system for network robots http://web.iir.nii.ac.jp/lab/english/research/adaptive-man-machine-interaction-based-on-stochastic-information-processing/	Assoc. Professor Tetsunari Inamura	Master's or Ph.D. Student		3-6 months	Requred skill: writing software in C++
25	Intelligent robotics	Integration of Robot Simulation and Social Agent Simulation http://web.iir.nii.ac.jp/lab/english/research/elucidation-of-genesis-of-social-intelligence/	Assoc. Professor Tetsunari Inamura	Master's or Ph.D. Student		3-6 months	Requred skill: writing software in C++
26	Quantum information	Quantum information using Bose-Einstein condensates (http://research.nii.ac.jp/~tbyrnes/)	Assist. Professor Timothy Byrnes	Master's or Ph.D. Student	2	2-6 months	
2. Information Systems Architecture Science Research Division							
27	Computer network	Measurement and analysis of Internet traffic. http://www.fukuda-lab.org	Assoc. Professor Kensuke Fukuda	Master's or Ph.D. Student	1	5-6 months	strong programming skills in C / C++
28	Computer network	Large-scale simulation for Internet topology analysis. http://www.fukuda-lab.org	Assoc. Professor Kensuke Fukuda	Master's or Ph.D. Student	1	5-6 months	strong programming skills in C/ C++
29	Interconnects in multi-processor systems	Low-power, and high-reliable interconnects in multi-processor systems (http://research.nii.ac.jp/~koibuchi/english/)	Assoc. Professor Michihiro Koibuchi	Master's or Ph.D. Student	2	2-6 months	

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30	Software Engineering	Co-Evolution of Models and Codes using Bidirectional Transformation (http://research.nii.ac.jp/~hu/project/intern.html)	Professor Zhenjiang Hu	Master's or Ph.D. Student	3	2-6 months	
31	Software Engineering	A Generic GUI for Supporting Bidirectional Model-driven Software Development (http://research.nii.ac.jp/~hu/project/intern.html)	Professor Zhenjiang Hu	Master's or Ph.D. Student		2-6 months	
32	Parallel Programming	Systematic Parallel Programming using Hadoop (http://research.nii.ac.jp/~hu/project/intern.html)	Professor Zhenjiang Hu	Master's or Ph.D. Student		2-6 months	
33	Parallel Programming	Parallel Tree/Graph Computation with MapReduce (http://research.nii.ac.jp/~hu/project/intern.html)	Professor Zhenjiang Hu	Master's or Ph.D. Student		2-6 months	
34	Software Engineering	Automated Diagnosis of C Programs http://researchmap.jp/nkjm/?lang=english	Professor Shin Nakajima	Master's or Ph.D. Student	1	4-6 months	preferably starting in August 2012
35	Software Engineering	Refinement Modeling with Event-B http://researchmap.jp/nkjm/?lang=english	Professor Shin Nakajima	Master student		3-5 months	pre-requisite : Event-B
36	Software Engineering	Co-analysis of Embedded System Design http://researchmap.jp/nkjm/?lang=english	Professor Shin Nakajima	Master's or Ph.D. Student		3-5 months	pre-requisite : Simulink
37	Software Engineering	Model-Checking of Flexible Communication Infrastructure http://researchmap.jp/nkjm/?lang=english	Professor Shin Nakajima	Master student		3-5 months	pre-requisite : Logic Model-Checking
38	Constraint Programming	Theory and Practice of Constraint Programming http://www.h.hosobe.org/internship	Assoc. Professor Hiroshi Hosobe	Master's or Ph.D. Student	2	3-6 months	
39	Computer Science	Bidirectional Graph Transformations http://research.nii.ac.jp/~hidaka/internship	Assist. Professor Soichiro Hidaka	Master's or Ph.D. Student	1	2-6 months	

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40	wireless networks	Resource management and QoS control in wireless networks http://research.nii.ac.jp/~kei/	Assoc. Professor Yusheng Ji	Master's or Ph.D. Student	up to 2* *subject to availability of seats	3 or 6 months	Basic understanding on infrastructure-based and/or ad hoc wireless communication systems is expected
41	network architecture	New architecture for future networks http://research.nii.ac.jp/~kei/	Assoc. Professor Yusheng Ji	Master's or Ph.D. Student	up to 2* *subject to availability of seats	3 or 6 months	Understanding on internet architecture and protocols is required
42	In-network processing	Implicit situation awareness of a wireless sensor network utilising channel quality estimations (https://klab.nii.ac.jp/~sigg/Implicit.pdf)	Assoc. Professor Yusheng Ji	Master's or Ph.D. Student	up to 2* *subject to availability of seats	4–6 months	contact: sigg@nii.ac.jp
43	Secure ad-hoc device pairing	Fuzzy cryptography for secure ad-hoc pairing of mobile devices (https://klab.nii.ac.jp/~sigg/Secure.pdf)	Assoc. Professor Yusheng Ji	Master's or Ph.D. Student	up to 2* *subject to availability of seats	4–6 months	contact: sigg@nii.ac.jp
44	In-network processing	Outsourcing mathematical operations in distributed processing to the wireless channel (https://klab.nii.ac.jp/~sigg/InNetwork.pdf)	Assoc. Professor Yusheng Ji	Master's or Ph.D. Student	up to 2* *subject to availability of seats	4–6 months	contact: sigg@nii.ac.jp
3. Digital Content and Media Sciences Research Division							
45	content-based image and video analysis	video and image semantic analysis and classification using local features (esp. TRECVID SIN task. see: http://www-nlpir.nist.gov/projects/trecvid/)	Professor Shin'ichi Satoh http://research.nii.ac.jp/~satoh	Master's or Ph.D. (Ph.D. preferable)	5	more than 90 days	
46	content-based image and video analysis	identification of specific object in video and image (esp. TRECVID instance search. see: http://www-nlpir.nist.gov/projects/trecvid/)	Professor Shin'ichi Satoh http://research.nii.ac.jp/~satoh	Master's or Ph.D. (Ph.D. preferable)		more than 90 days	
47	content-based image and video analysis	“Beyond Content Based Copy Detection,” explore potential video mining applications	Professor Shin'ichi Satoh http://research.nii.ac.jp/~satoh	Master's or Ph.D. (Ph.D. preferable)		more than 90 days	
48	content-based image and video analysis	Event detection and action recognition (esp. TRECVID MED task. see: http://www-nlpir.nist.gov/projects/trecvid/)	Professor Shin'ichi Satoh http://research.nii.ac.jp/~satoh	Master's or Ph.D. (Ph.D. preferable)		more than 90 days	
49	content-based image and video analysis	Face Sequence Indexing and Matching for Broadcast Videos	Professor Shin'ichi Satoh http://research.nii.ac.jp/~satoh	Master's or Ph.D. (Ph.D. preferable)		more than 90 days	

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50	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 - Gaze sensing and visual attention estimation http://research.nii.ac.jp/~sugimoto/	Professor Akihiro Sugimoto	Master's or Ph.D. Student	3	Up to 6 months (at least 3 months; a longer period is better)	Rigorous background on mathematics is required. Programming skills on image processing and computer vision are also required. In the case of Master course students, hilghly motivated students who can stay for 6 months are preferable. Potential applicants can send your CV and research interests directly to Prof. Sugimoto before your application.
51	mathematical engineering	Digital shape fitting to noisy integer points	Professor Akihiro Sugimoto	PhD student only	1	Up to 6 months (at least 3 months)	Rigorous background on mathematics as well as computer vision 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. Potential applicants can send your CV and research interests directly to Prof. Sugimoto before your application.
52	Natural Language Processing	Syntactic and Semantic Parsing http://www-tsujii.is.s.u-tokyo.ac.jp/enju/	Assoc. Professor Yusuke Miyao	Master's or Ph.D. Student	1	6 months	Fundamental knowledge about one of the following areas are required: 1. formal language theory, 2. statistical machine learning, or 3. syntactic/semantic theory
53	text mining	A study on text mining based on probabilistic latent models (http://www.ldear.nii.ac.jp/~takasu/en/)	Professor Atsuhiro Takasu	Master's or Ph.D. Student	2	2-6 months	
54	signal processing	Inpainting for Images Synthesized via Depth-Image-Based Rendering (http://research.nii.ac.jp/~cheung/intern.html)	Assist. Professor Gene Cheung	Master's or Ph.D. Student	1	3-6 months	Computer programming skills in C / C++. Strong fundamentals in signal processing & optimization.
55	signal processing	Joint Analysis of Eye Gaze Patterns and Visual Saliency Maps of Visual Content (http://research.nii.ac.jp/~cheung/intern.html)	Assist. Professor Gene Cheung	Master's or Ph.D. Student	1	3-6 months	Computer programming skills in C / C++. Strong fundamentals in signal processing & optimization.

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56	Content security	Fundamental techniques and systems for content security http://research.nii.ac.jp/~iechizen/official/content_e.html	Assoc. Professor Isao Echizen	Master's or Ph.D. Student	4	3-6 months	
57	Content security	Privacy in business process http://research.nii.ac.jp/~iechizen/official/content_e.html http://research.nii.ac.jp/~iechizen/official/content_e_sven.html	Assoc. Professor Isao Echizen	Master's or Ph.D. Student		3-6 months	
58	Environmental Information Systems	Image processing, machine learning, and mobile computing for climate, agriculture, and biodiversity: http://agora.ex.nii.ac.jp/~kitamoto/education/internship/index.html.en	Assoc. Professor Asanobu Kitamoto	Master's or Ph.D (Ph.D. preferable)	2	3-6 months	Programming skill is required. An interdisciplinary topic, possibly working with domain experts.
59	Crisis Information Systems	Event detection, natural language processing, and visualization for severe weather and natural disasters: http://agora.ex.nii.ac.jp/~kitamoto/education/internship/	Assoc. Professor Asanobu Kitamoto	Master's or Ph.D (Ph.D. preferable)	2	3-6 months	Programming skill is required. An interdisciplinary topic, possibly working with domain experts.
60	Digital Humanities	3D CG modeling, GIS, Semantic Web, and multilingual processing for cultural heritage and museums: http://agora.ex.nii.ac.jp/~kitamoto/education/internship/index.html.en	Assoc. Professor Asanobu Kitamoto	Master's or Ph.D (Ph.D. preferable)	2	3-6 months	Programming skill is required. An interdisciplinary topic, possibly working with domain experts.
61	Biological Image Analysis	Image processing and machine learning for biological imaging and neural activity analysis. http://agora.ex.nii.ac.jp/~kitamoto/education/internship/	Assoc. Professor Asanobu Kitamoto	Master's or Ph.D (Ph.D. preferable)	2	3-6 months	Programming skill is required. An interdisciplinary topic, possibly working with domain experts.
62	Services Computing, Cloud Computing	Quality-Assured Integration and Delivery of Web/Ambient Services http://research.nii.ac.jp/~f-ishikawa/internships/index.html	Assoc. Professor Fuyuki Ishikawa	Master's or Ph.D. Student	3	2-6 months	
63	Software Engineering, Formal Methods	Software Engineering with Formal Modeling and Analysis http://research.nii.ac.jp/~f-ishikawa/internships/index.html	Assoc. Professor Fuyuki Ishikawa	Master's or Ph.D. Student		2-6 months	

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64	3D Internet and Virtual Worlds (Foundations)	R&D in the foundations of networked massively multi-user 3D virtual environments, based on our original framework (DiVE) and Unity3D http://www.prendingerlab.net/globallab/	Assoc. Professor Helmut Prendinger	Master's or Ph.D. Student	9	3-6 months	Solid programming background (e.g. C++ or C Sharp) Longer stay preferred for good result (some interesting software). Paper writing will be supported.
65	3D Internet and Virtual Worlds (Serious Games)	Application-oriented R&D based on 3D virtual environments (Unity3D), incl. "serious games" for practicing eco-friendly driving with multi-user driving simulator, disaster evacuation, etc. http://www.prendingerlab.net/globallab/projects/	Assoc. Professor Helmut Prendinger	Master's or Ph.D. Student		3-6 months	Solid programming background (e.g. C++ or C Sharp) Longer stay preferred for good result (some interesting software). Paper writing will be supported.
66	AI-based Content Creation	Implementation of Artifical Intelligence (AI) techniques for automated content creation in 3D virtual worlds (behavior, dialogue, story, etc) http://www.prendingerlab.net/globallab	Assoc. Professor Helmut Prendinger	Master's or Ph.D. Student		3-6 months	Solid programming background (e.g. C++ or C Sharp) Longer stay preferred for good result (some interesting software). Paper writing will be supported.
67	Computer Vision and Computer Graphics	Computational Photography: Image-based rendering, Image processing, Color analysis, Spectral imaging http://research.nii.ac.jp/~imarik	Assoc. Professor Imari Sato	Master's or Ph.D. Student	2	5-6 months	A basic knowledge of computer graphics and good programming skills are required
68	Interaction analysis	Understanding multi-party interaction and its application (http://research.nii.ac.jp/~bono/en/aboutus/internship.html)	Assist. Professor Mayumi Bono	Master's or Ph.D. Student	1	2-6 months	
69	Interaction analysis	Data collection and analysis of multimodal interaction (http://research.nii.ac.jp/~bono/en/aboutus/internship.html)	Assist. Professor Mayumi Bono	Master's or Ph.D. Student	1	2-6 months	
70	Interaction analysis	Sign language communication and its community (http://research.nii.ac.jp/~bono/en/aboutus/internship.html)	Assist. Professor Mayumi Bono	Master's or Ph.D. Student	1	2-6 months	
71	Interaction analysis	The use of Telecommunication technologies (http://research.nii.ac.jp/~bono/en/aboutus/internship.html)	Assist. Professor Mayumi Bono	Master's or Ph.D. Student	1	2-6 months	

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4. Information and Society Research Division							
72	International Public Policy of IT-enabled Services	Consumers' Technology Acceptance of Cross Border Electronic Commerce and Socialmedia Commerce http://www.nii.ac.jp/en/faculty/okada_hitoshi/	Assoc. Professor Hisashi Okada	Master's or Ph.D. Student	1	2-3months	Statistics Knowledge is highly appreciated.
5. Collaborative Research Division							
73	Data Mining	Unsupervised Feature Selection (http://typhoon.nii.ac.jp/~meh/internship/intern-proj-features.doc)	Visiting Professor Michael Houle	Master's or Ph.D. Student	5	3-6 months	Priority given to PhD students for internships of 5-6 months.
74	Data Mining	Dynamic Query-Result Clustering (http://typhoon.nii.ac.jp/~meh/internship/intern-proj-qclust.doc)	Visiting Professor Michael Houle	Master's or Ph.D. Student		3-6 months	
75	Data Mining	Distributed Data Clustering (http://typhoon.nii.ac.jp/~meh/internship/intern-proj-pclust.doc)	Visiting Professor Michael Houle	Master's or Ph.D. Student		3-6 months	Priority given to PhD students for internships of 5-6 months.
76	Data Mining	Nearest-Neighbor Classification and Applications (http://typhoon.nii.ac.jp/~meh/internship/intern-nn-classification.doc)	Visiting Professor Michael Houle	Master's or Ph.D. Student		3-6 months	
77	Databases	Rank-based Similarity Search (http://typhoon.nii.ac.jp/~meh/internship/intern-proj-simrsearch.doc)	Visiting Professor Michael Houle	Master's or Ph.D. Student		3-6 months	Priority given to PhD students for internships of 5-6 months.
78	Multimedia	Detection of Basic Shape Elements in Images (http://typhoon.nii.ac.jp/~meh/internship/intern-geons.doc)	Visiting Professor Michael Houle	Ph.D. Student	1	3 months	