List of research topics for NII International Internship Program 2019 1st Call

No.	Research area	Title of the research	Website	Name of supervisor	Title of the supervisor	Requirements for applicants: Master's / Ph.D. Student	Total number of acceptance per supervisor	Duration : 2-6months (less than 180days)	Comments
1. Principles of Informatics Research Division									
1	Software verification	Separation logic	http://research.nii.ac.jp/~tatsuta/index-e.html	Makoto Tatsuta	Professor	Master's or PhD students	2	2-6 months	
2	Theoretical computer science and machine learning/statistics	Constant-time algorithms for machine learning/statistics problems		Yuichi Yoshida	Associate Professor	PhD students	2	2-6 months	
3	Theoretical computer science	Stability analysis of algorithms		Yuichi Yoshida	Associate Professor	PhD students		2-6 months	
4	Theoretical computer science and data mining	Submodular Laplacian theory		Yuichi Yoshida	Associate Professor	PhD students		2-6 months	
5	Artificial Intelligence / Web Informatics	Semantic Web / Linked Data / Linked Open Data	http://lod.ac http://www-kasm.nii.ac.jp/	Hideaki Takeda	Professor	Master's or PhD students	3	3-6months	
6	Artificial Intelligence / Web Informatics	Social Web / Social Media Analysis / Social Network Analysis	http://www-kasm.nii.ac.jp/	Hideaki Takeda	Professor	Master's or PhD students		3-6months	
7	Artificial Intelligence	Articiial Social Intelligence: building intelligence systems with social knowledge and social interaction		Hideaki Takeda	Professor	Master's or PhD students		3-6months	
8	Web & Social Media analysis, Time series analysis	Modeling human activity through mining social time series	http://research.nii.ac.jp/~r-koba/en/index.html	Ryota Kobayashi	Assistant Professor	PhD students	2	3-6months	We will develop a toolbox for Web datamining. Basic knowledge about Probability and Statistics are necessary. Machine learning and/or natural language processing techniques is appreciated. See papers in my website for details (Aoki et al., 2016; Kobayashi & Lamboitte 2016).
9	Computational Neuroscience, Simulation	Brain simulation	http://research.nii.ac.jp/~r-koba/en/index.html	Ryota Kobayashi	Assistant Professor	PhD students		3-6months	Basic knowledge about differential equations are necessary. Optimization or simulation methods for differential equations will be appreciated.
10	Machine Learning	Machine learning with discrete structure	https://mahito.info/index_e.html	Mahito Sugiyama	Associate Professor	PhD students	3	6 months	

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11	Machine Learning	Machine learning with information geometry	https://mahito.info/index_e.html	Mahito Sugiyama	Associate Professor	PhD students		6 months	
12	Machine Learning	Machine learning with software engineering	https://mahito.info/index_e.html	Mahito Sugiyama	Associate Professor	PhD students		6 months	
13	Knowledge Representation and Reasoning	Tensor-Based Automated Reasoning	http://research.nii.ac.jp/il/	Katsumi Inoue	Professor	Master's or PhD students	3	3-6 months	Basic knowledge of ASP/CP/SAT solving, deductive/abductive/inductive reasoning, GPU computing and/or linear algebra are required. Experience in C++, CUDA, Octave, OpenCL or Python is useful. Contact Prof. Inoue in advance.
14	Knowledge Representation and Reasoning	Integration of Knowledge Representation and Machine Learning	http://research.nii.ac.jp/il/	Katsumi Inoue	Professor	Master's or PhD students		3-6 months	Knowledge in KR, logics, abduction, ILP, CSP and/or belief change as well as machine learning or representation learning are advantageous to tackle this subject. Contact Prof. Inoue in advance.
15	Machine Learning	Learning Relational Dynamics from State Transition	http://research.nii.ac.jp/il/	Katsumi Inoue	Professor	Master's or PhD students		3-6 months	Basic knowledge of machine learning and/or inductive logic programming are required. Additionally, knowledge in planning or model checking is useful. Contact Prof. Inoue in advance.
16	Multi-Agent Systems	Resilient AI	http://research.nii.ac.jp/il/	Katsumi Inoue	Professor	Master's or PhD students		3-6 months	Basic knowledge in AI and constraints as well as computer programming skills are required. Contact Prof. Inoue in advance.
17	Quantum computationand communicatio	Computer archtecture for quantum information processing	http://www.qis.ex.nii.ac.jp/	Kae Nemoto	Professor	Master's or PhD students	3	2-6 months	
18	Quantum computationand communicatio	Quantum devices	http://www.qis.ex.nii.ac.jp/	Kae Nemoto	Professor	Master's or PhD students		2-6 months	
19	Quantum systems	Analyses of large-scale quantum systems		Kae Nemoto	Professor	Ph D students		2-6 months	
20	juris-informatics	NLP for legal texts		Ken Satoh	Professor	Master's or PhD students	3	2-3 months	strong knowledge in NLP and law is required.
21	juris-informatics	constructing legal ontology		Ken Satoh	Professor	Master's or PhD students		2-3 months	strong knowledge in ontology and law is required.

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22	juris-informatics	legal compliance and revision		Ken Satoh	Professor	Master's or PhD students		2-3 months	strong knowledge in logical reasoning and law is required.
23	juris-informatics	legal reasoning		Ken Satoh	Professor	Master's or PhD students		2-3 months	strong knowledge in logical reasoning and law is required.
24	Airtificial Intelligence	Machine Learning for Advanced Driving Assistance Systems	http://ri-www.nii.ac.jp/	Ryutaro Ichise	Associate Professor	Master's or PhD students	4	3 to 6 months	
25	Airtificial Intelligence	Knowledge Graph / Linked Data	http://ri-www.nii.ac.jp/	Ryutaro Ichise	Associate Professor	Master's or PhD students		3 to 6 months	
26	Airtificial Intelligence	Data Mining for Large Scale Data	http://ri-www.nii.ac.jp/	Ryutaro Ichise	Associate Professor	Master's or PhD students		3 to 6 months	
27	Airtificial Intelligence	Ontology Learning / Mapping	http://ri-www.nii.ac.jp/	Ryutaro Ichise	Associate Professor	Master's or PhD students		3 to 6 months	
28	Numerical Linear Algebra	Iterative solution of systems of linear equations and least square problems, etc.	https://researchmap.jp/KenHayami/ http://research.nii.ac.jp/~hayami/index-e.html http://epubs.siam.org/doi/pdf/10.1137/130946009	Ken Hayami	Professor	Master's or PhD students	2	6 months	Basic knowledge of numerical linear algebra is desirable.
29	Inverse Problems	Application and improvement of the Cluster Gauss Newton (CGN) method for parameter identification of Pharmacokinetic models, dyanamical systems, etc.	https://researchmap.jp/KenHayami/ http://research.nii.ac.jp/~hayami/index-e.html https://arxiv.org/abs/1808.06714v2	Ken Hayami	Professor	Master's or PhD students		6 months	Basic knowledge of numerical analysis is desirable.
30	Intelligent Robotics	Human-Robot Interaction in Vritual/Augmented Reality	http://www.iir.nii.ac.jp/lab/research-e/sigverse/	Tetsunari Inamura	Associate Professor	Master's or PhD students	3	3 - 6 months	
31	Cognitive Science	Research on sense of agency and sense of ownership using virtual reality	http://www.iir.nii.ac.jp/lab/research-e/embodied-brain/	Tetsunari Inamura	Associate Professor	Master's or PhD students		3 - 6 months	

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2. Information Systems Architecture Science Research Division									
32	Theoretical Computer Science	Automata-Theoretic Techniques in Formal Verification	http://group-mmm.org/eratommsd/about.html	Ichiro Hasuo	Associate Professor	Master's or PhD students	5	6 months (or shorter)	Our focus will be on quantiative modeling and verification (probabilistic, weighted, timed, etc.). Desired: solid backgrounds in logic, automata and formal languages
33	Software Science	Machine Learning Techiniques Applied to Search-Based Testing	http://group-mmm.org/eratommsd/about.html	Ichiro Hasuo	Associate Professor	Master's or PhD students		6 months (or shorter)	Search-based testing of cyber-physical systems (also called "falsification") is attracting attention as a practical quality-assurance technique. It nicely combines formal methods and machine learning on the theoretical sides; on the implementation side there are many interesting challenges, too.
34	Software Science/Control Engineering	Optimization-Based Synthesis of Lyapunov Functions and Other Correctness Certificates	http://group-mmm.org/eratommsd/about.html	Ichiro Hasuo	Associate Professor	Master's or PhD students		6 months (or shorter)	Correctness certificates for various systems and specifications (Lyapunov functions, ranking functions, invariants, etc.) sometimes allow efficient numeric search via convex optimization algorithms. This is also where software science and control engineering meet.
35	Theoretical Computer Science	Categorical Modeling of Verification Techniques	http://group-mmm.org/eratommsd/about.html	Ichiro Hasuo	Associate Professor	Master's or PhD students		6 months (or shorter)	Various verification techniques allow abstraction by the language of category theory (especially coalgebras). This sometimes aids generalization and transition from qualitative to quantitative. Desired: familiarity with basic category theory.
36	Software Science	Analysis of Probabilistic Programs	http://group-mmm.org/eratommsd/about.html	Ichiro Hasuo	Associate Professor	Master's or PhD students		6 months (or shorter)	We use the combination of programming language theory, formal methods and probability theory, in order to devise novel analysis methods for probabilistic programs. Concrete examples include the following: Martingale-based termination analysis, sequential and Markov chain Monte Carlo methods, etc.
37	Wireless and Mobile Communication Networks, Machine Learning	Deep learning techniques for optimizing beyond 5G and IoT wireless communications	http://www.nii.ac.jp/en/faculty/architecture/kaneko_megumi/	Megumi Kaneko	Associate Professor	Master's or PhD students	3	5-6 months	Required programming skills: Matlab. Basic knowledge wireless/digital communications and signal processing is required.
38	Wireless and Mobile Communication Networks	Energy and spectrum efficiency optimization for future IoT Low Power Wide Area Networks (LPWAN)	http://www.nii.ac.jp/en/faculty/architecture/kaneko_megumi/	Megumi Kaneko	Associate Professor	Master's or PhD students		5-6 months	Required programming skills: Matlab. Basic knowledge wireless/digital communications and signal processing is required.

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39	Wireless and Mobile Communication Networks	Radio access protocol design for UAV and space networks	http://www.nii.ac.jp/en/faculty/architecture/kaneko_megumi/	Megumi Kaneko	Associate Professor	Master's or PhD students		5-6 months	Required programming skills: Matlab. Basic knowledge wireless/digital communications and signal processing is required.
40	Mobile Computing	Mobile Edge Computing	http://klab.nii.ac.jp/	Yusheng Ji	Professor	Master's or PhD students	4	3 to 6 months	
41	Wireless Communication	Connected Vehicles	http://klab.nii.ac.jp/	Yusheng Ji	Professor	Master's or PhD students		3 to 6 months	
42	Networking	AI/ML for Networking	http://klab.nii.ac.jp/	Yusheng Ji	Professor	Master's or PhD students		3 to 6 months	
43	Software Engineering, Machine Learning, Testing, Artificial Intelligence	Testing and Quality Analysis of Machihne Learning Systems	http://research.nii.ac.jp/~f-ishikawa/en/lab.html	Fuyuki Ishikawa	Associate Professor	Master's or PhD students	5	2-6 months	
44	Cyber-Physical Systems, Software Engineering, Testing, Optimization	Intelligent Automated Testing for Cyber-Physical Systems	http://research.nii.ac.jp/~f-ishikawa/en/lab.html	Fuyuki Ishikawa	Associate Professor	Master's or PhD students		2-6 months	
45	Formal Methods, Software Engineering, Cyber-Physical Systems	Refinement-based Modeling and Verification of Smart Cyber-Physical Systems	http://research.nii.ac.jp/~f-ishikawa/en/lab.html	Fuyuki Ishikawa	Associate Professor	Master's or PhD students		2-6 months	
46	Hardware Design	Hardware Implementation of Spiking Neural Networks	http://www.nii.ac.jp/en/faculty/architecture/yoneda_tomohiro/	Tomohiro Yoneda	Professor	Master's or PhD students	1	6 months	
47	Programming Languages	Type error debugging of functional languages	http://link.springer.com/chapter/10.1007%2F978-3-642-41582-1_12#page-1, http://www.is.ocha.ac.jp/~asai/TypeDebugger/	Kanae Tsushima	Assistant Professor	Master's or PhD students	3	3-6 months	Interested in developing practical software systems.
48	Programming Languages	Type error debugging using machine learning	http://researchmap.jp/tsushima/?lang=english	Kanae Tsushima	Assistant Professor	Master's or PhD students		3-6 months	Interested in programming languages and machine learning.
49	Programming Languages	Test case generation for typed languages	http://researchmap.jp/tsushima/?lang=english	Kanae Tsushima	Assistant Professor	Master's or PhD students		3-6 months	
50	Programming Language	Type-safe handling of polymorphic algebraic effects		Taro Sekiyama	Assistant Professor	Master's or PhD students	2	6 months	
51	Machine Learning and Automated Theorem Proving	Automated theorem proving with machine learning		Taro Sekiyama	Assistant Professor	Master's or PhD students		6 months	

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52	Computer network	Web privacy measurement	http://www.fukuda-lab.org	Kensuke Fukuda	Associate Professor	Master's or PhD students	3	5 or 6 months	Solid programming skill in python and/or javascript
53	Computer network	Network security measurement	http://www.fukuda-lab.org	Kensuke Fukuda	Associate Professor	Master's or PhD students		5 or 6 months	Solid programming skill in python or C
54	Computer network	Network logdata mining	http://www.fukuda-lab.org	Kensuke Fukuda	Associate Professor	Master's or PhD students		5 or 6 months	Solid programming skill in python and ML
55	Requirements Engineering and Machine Learning	Requirements Engineering for Machine Learning-based Systems	https://www.nii.ac.jp/en/faculty/architecture/yoshioka_nobukazu/ http://www.jst.go.jp/mirai/jp/uploads/saitaku2018/JPMJMI18BA_yoshioka.pdf	Nobukazu Yoshioka	Associate Professor	Master's or PhD students	2	6 months	
3. Digital Content and Media Sciences Research Division									
56	content-based image and video analysis	video and image search (esp. TRECVID AVS task. see: http://www-nlpir.nist.gov/projects/trecvid/)	http://www.satoh-lab.nii.ac.jp/	Shin'ichi Satoh	Professor	Master's or PhD students	3	more than 90 days	
57	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/)	http://www.satoh-lab.nii.ac.jp/	Shin'ichi Satoh	Professor	Master's or PhD students		more than 90 days	
58	content-based image and video analysis	Video Event Analysis (esp. TRECVID SMKBP or ActEv task. see: http://www-nlpir.nist.gov/projects/trecvid/)	http://www.satoh-lab.nii.ac.jp/	Shin'ichi Satoh	Professor	Master's or PhD students		more than 90 days	
59	content-based image and video analysis	Image and Video Captioning (esp. TRECVID Video-to-Text pilot task or Microsoft Video to Language Challenge: see http://ms-multimedia-challenge.com/challenge)	http://www.satoh-lab.nii.ac.jp/	Shin'ichi Satoh	Professor	Master's or PhD students		more than 90 days	
60	Computer vision	One of the following topics: (1) 3D vision, (2) Human activitiy recognition, (3) Gaze sensing and navigation, (4) Object segmentation from video using deep learning, and (5) Image/video generation using deep learning	http://www.dgcv.nii.ac.jp	Akihiro Sugimoto	Professor	Master's or PhD students	5	Up to 6 months (at least 3 months; a longer period is better)	Rigorous background on mathematics is required. Strong programming skills on image processing and computer vision are also required. In the case of Master course students, highly motivated students who can stay for 6 months are preferable. Students who are willing to pursuit ph D at NII are preferable as well. Potential applicants should send your CV and research interests/proposals directly to Prof. Sugimoto before your application.

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61	Digital geometry	(1) Discretization model of geometric shape, (2) Discrete shape fitting to noisy integer points.	http://www.dgcv.nii.ac.jp	Akihiro Sugimoto	Professor	Master's or PhD students		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 should send your CV and research interests/proposals directly to Prof. Sugimoto before your application.
62	Text Media	Analysis and assistance of human reading/writing	http://www-al.nii.ac.jp	Akiko Aizawa	Professor	Master's or PhD students	3	3-6 months (6 month is preferable)	
63	Text Media	Scientific paper analysis and mining	http://www-al.nii.ac.jp	Akiko Aizawa	Professor	Master's or PhD students		3-6 months (6 month is preferable)	
64	Text Media	Natural language understanding	http://www-al.nii.ac.jp	Akiko Aizawa	Professor	Master's or Ph.D Student		3-6 months (6 month is preferable)	
65	Multimedia Data Mining and Analysis	Multimodal deep learning for multimedia content recommendation, venue inference, enhancing online education by leveraging social media techniques	http://research.nii.ac.jp/~yiyu/	Yi Yu	Assistant Professor	Master's or Ph.D Student	4	3-6 months	
66	Music Information Retrieval and Its Applications	Cross-modal deep correlation learning between audio-text, audio-video, and audio-EEG, content-based cross-modal music retrieval, lyrics to melody generation by deep learning	http://research.nii.ac.jp/~yiyu/	Yi Yu	Assistant Professor	Master's or Ph.D Student		3-6 months	
67	text mining	Text mining based on embedding model	http://www.ldear.nii.ac.jp/~takasu/en/	Atsuhiro Takasu	Professor	Master's or PhD students	3	3-6 months	
68	big data	data analysis and mining methods for (sensor) big data	http://www.ldear.nii.ac.jp/~takasu/en/	Atsuhiro Takasu	Professor	Master's or PhD students		3-6 months	
69	Traditional Geometric Computer Vision	3D Reconstruction for Large-Scale Image Collections; 3D Scan Using Mobile Devices; Underwater 3D Reconstruction	http://researchmap.jp/yinqiangzheng	Yinqiang Zheng	Associate Professor	Master's or PhD students	4	2-6 months	Students aiming at top conferences (ICCV, CVPR, ECCV) and journals (PAMI, IJCV) are encouraged to join us.
70	Data-Driven Geometric Computer Vision	Deep Learning for 3D Capture, Point Cloud Denosing, Surface Completion, CAD Model Extraction and Realistic Rendering	http://researchmap.jp/yinqiangzheng	Yinqiang Zheng	Associate Professor	Master's or PhD students		2-6 months	Students aiming at top conferences (ICCV, CVPR, ECCV) and journals (PAMI, IJCV) are encouraged to join us.

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71	Traditional Photometric Computer Vision	Multispectral and Hyperspectral Imaging System; Spectral Image Denosing and Superresolution; Intrinsic Images; Polarizing Imaging;	http://researchmap.jp/yinqiangzheng	Yinqiang Zheng	Associate Professor	Master's or PhD students		2-6 months	Students aiming at top conferences (ICCV, CVPR, ECCV) and journals (PAMI, IJCV) are encouraged to join us.
72	Data-Driven Photometric Computer Vision	Deep Learning for Image Enhancement, Colorization, Style Transfer; Data-Driven Optimal Camera Design for Object Detection and Recognition	http://researchmap.jp/yinqiangzheng	Yinqiang Zheng	Associate Professor	Master's or PhD students		2-6 months	Students aiming at top conferences (ICCV, CVPR, ECCV) and journals (PAMI, IJCV) are encouraged to join us.
73	data science	Cooking Execution Plan Optimisation based on nutrition and cooking constraints	https://goo.gl/h68m41	Frederic Andres	Associate Professor	Master's or PhD students	6	up to 6 months	Collaboration with SIGCIDC (Special Interest Group on Collective Intelligence and Digital Cooking)
74	data science	Food Price Time Series Knowledge Base Management	https://goo.gl/4dv2HP	Frederic Andres	Associate Professor	Master's or PhD students		up to 6 months	Collaboration with SIGCIDC (Special Interest Group on Collective Intelligence and Digital Cooking)
75	social media	Frequent Subgraph Mining on Evolving and Distributed Graphs	https://goo.gl/35Nu73	Frederic Andres	Associate Professor	Master's or PhD students		up to 6 months	Collaboration with UCA (France) and SIGCIDC
76	social media	Mulsemedia tasting experience	https://goo.gl/yDsJv6	Frederic Andres	Associate Professor	Master's or PhD students		up to 6 months	Collaboration with SIGCIDC (Special Interest Group on Collective Intelligence and Digital Cooking)
77	Education Science for higher education	Web Real-Time Communication server for WebELS	https://goo.gl/LK6tNx	Frederic Andres	Associate Professor	Master's or PhD students		up to 6 months	project under ISO SC 36 and international coopertions.
78	Data science	EPP Water Crystal Classification	https://goo.gl/VMQKSH	Frederic Andres	Associate Professor	Master's or PhD students		up to 6 months	project uder the cooperation with EPP NGO
79	Digital Humanities	Machine learning for image processing (esp. character recognition), geographic information, linked data and metadata management for cultural heritage	http://agora.ex.nii.ac.jp/~kitamoto/education/internship/	Asanobu Kitamoto	Associate Professor	Master's or PhD students	4	3-6 months	A student with programming skills and interests in real problems is preferred.
80	Earth Environmental Informatics	Big data analytics (esp. image processing, remote sensing and machine learning) for societal problems such as environment and sustainability	http://agora.ex.nii.ac.jp/~kitamoto/education/internship/	Asanobu Kitamoto	Associate Professor	Master's or PhD students		3-6 months	A student with programming skills and interests in real problems is preferred.

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81	Crisis Informatics	Big data analytics (esp. image processing, natural language processing, and machine learning) for natural disasters and crisis	http://agora.ex.nii.ac.jp/~kitamoto/education/internship/	Asanobu Kitamoto	Associate Professor	Master's or PhD students		3-6 months	A student with programming skills and interests in real problems is preferred.
82	Open Science	Research on a new trend of science, such as open data, data citation, citizen science, and open innovation	http://agora.ex.nii.ac.jp/~kitamoto/education/internship/	Asanobu Kitamoto	Associate Professor	Master's or PhD students		3-6 months	A student with programming skills and interests in real problems is preferred.
83	Computer Vision and Computer Graphics	Computational Photography: Deep learning, Image-based rendering, Image processing, Color analysis, Spectral imaging	http://research.nii.ac.jp/~imarik/ http://research.nii.ac.jp/pbv/	Imari Sato	Professor	Master's or PhD students	2	5 to 6 month	A basic knowledge of Image Analysis and/or Machine learning, and good programming skills are required
84	Speech information processing	Expressive speech synthesis using deep learning	Relevant papers include, but do not limited to, [1] Jaime Lorenzo-Trueba, Gustav Eje Henter, Shinji Takaki, Junichi Yamagishi, Yosuke Morino, Yuta Ochiai, Investigating different representations for modeling and controlling multiple emotions in DNN-based speech synthesis, Speech Communication 99 135-143 May 2018	Junichi Yamagishi	Professor	PhD students	3	4-6 months	The successful candidate should be a PhD student in speech processing, computer science, engineering, linguistics, mathematics, or a related discipline. He or she should have strong programming skills and experience with speech processing. • Familiarity with DNN tools and speech tools are preferable
85	Speech information processing	End-to-end speech synthesis and waveform modeling using deep learning	Relevant papers include, but do not limited to, [2] Xin Wang, Shinji Takaki, Junichi Yamagishi, "Neural source-filter-based waveform model for statistical parametric speech synthesis", Accepted for ICASSP 2019 May 2019 and [3] Yusuke Yasuda, Xin Wang, Shinji Takaki, Junichi Yamagishi, "Investigation of enhanced Tacotron text-to-speech synthesis systems with self-attention for pitch accent language", Accepted for ICASSP 2019 May 2019	Junichi Yamagishi	Professor	PhD students		4-6 months	The successful candidate should be a PhD student in speech processing, computer science, engineering, linguistics, mathematics, or a related discipline. He or she should have strong programming skills and experience with speech processing and/or machine learning. • Familiarity with DNN tools and speech tools are preferable

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86	Speech information processing	Multi-speaker speech synthesis and adaptation	Relevant papers include, but do not limited to, [4] Yi Zhao, Shinji Takaki, Hieu-Thi Luong, Junichi Yamagishi, Daisuke Saito, Nobuaki Minematsu, "Wasserstein GAN and Waveform Loss-based Acoustic Model Training for Multi-speaker Text-to-Speech Synthesis Systems Using a WaveNet Neural Vocoder", IEEE Access 6(1) 60478-60488 Dec 2018 and [5] Hieu-Thi Luong, Junichi Yamagishi, "Scaling and bias codes for modeling speaker-adaptive DNN-based speech synthesis systems", SLT 2018: The IEEE Workshop on Spoken Language Technology, Dec 2018	Junichi Yamagishi	Professor	PhD students		4-6 months	The successful candidate should be a PhD student in speech processing, computer science, engineering, linguistics, mathematics, or a related discipline. He or she should have strong programming skills and experience with speech processing and/or machine learning. • Familiarity with DNN tools and speech tools are preferable
87	Speech information processing	Automatic speaker verifications and its anti-spoofing	Relevant papers and webpage include, but do not limited to, [6] Md Sahidullah, Hector Delgado, Massimiliano Todisco, Tomi Kinnunen, Nicholas Evans, Junichi Yamagishi, and Kong-Aik Lee, "Introduction to Voice Presentation Attack Detection and Recent Advances" (Chapter 15, Handbook of Biometric Anti-Spoofing, 2nd edition) [7] Cheng-I Lai, Alberto Abad, Korin Richmond, Junichi Yamagishi, Najim Dehak, Simon King, "Attentive Filtering Networks for Audio Replay Attack Detection", Accepted for ICASSP 2019 May 2019 http://www.asvspoof.org	Junichi Yamagishi	Professor	PhD students		4-6 months	The successful candidate should be a PhD student in speech processing, computer science, engineering, linguistics, mathematics, or a related discipline. He or she should have strong programming skills. Familiarity with software tools including ALIZE, MSR identity toolbox, Sidekit is preferable
88	Speech information processing	Multi-modal speech processing	Relevant papers include, but do not limited to, [8] Fuming Fang, Xin Wang, Junichi Yamagishi, Isao Echizen, "Audiovisual speaker conversion: jointly and simultaneously transforming facial expression and acoustic characteristics", Accepted for ICASSP 2019 May 2019	Junichi Yamagishi	Professor	PhD students		4-6 months	Examples of multimodalities include audio visual synthesis/verification, automatic natural language generation, machine translation, articulatory information. The successful candidate should be a PhD student in speech processing, computer science, engineering, linguistics, mathematics, or a related discipline. He or she should have strong programming skills. Familiarity with relevant software tools including DNN tools is preferable

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No.	Research area	Title of the research	Website	Name of supervisor	Title of the supervisor	Requirements for applicants: Master's / Ph.D. Student	Total number of acceptance per supervisor	Duration : 2-6months (less than 180days)	Comments
89	Unmanned Aircraft Systems Traffic Management (UTM) - Scalable Algorithms and Real-time Distributed Systems	Research and development of algorithms and systems for: (1) Scalable Pre-Flight Conflict Detection and Resolution (CDR) among UAVs (Unmanned Aerial Vehicles, or "drones"), e.g. Cooperative A*, Enhanced Conflict Based Search, etc., (2) Real-time In-Flight CDR methods, e.g. ORCA (Optimal Reciprocal Collision Avoidance), and (3) Investigation and implementation of entire UTM architecture, incl. real-world field testing.	www.siliconmountain.jp	Helmut Prendinger	Professor	Master and PhD students	6	4-6 months	Description: This work is part of a new large-scale Japanese Government project on designing, specifying, and testing UTM in Japan. It is similar to NASA UTM in US and u-Space in Europe. Qualifications: Software development experience in Java and C++. Good knoweledge of the Client-Server model and main Data Structures, Design Patterns (e.g. Singleton, Strategy, etc) and Algorithms. Experience with client-side web technologies (e.g. HTML, CSS, Javascript, Bootstrap) and/or mobile app development (e.g. Android) is a plus. Demonstrated interest into develop robust software to be tested in the real world with real drones. Longer stay (6 months) is preferred for good result or publication (http://research.nii.ac.jp/~prendinger/)
90	UTM System - Auction based mechanisms for path allocation	Research and development of auction based methods for allocating flying paths in shared airspace, see, e.g., O. Amir, G. Sharon, R. Stern, "Multi-agent path finding as a combinatorial auction", Proc AAAI 2015	www.siliconmountain.jp	Helmut Prendinger	Professor	Master and PhD students		4-6 months	Programming experience in Java and C++; Solid background in data structures, algorithms and demonstrated interest in combinatorial auctions. (http://research.nii.ac.jp/~prendinger/)
91	Deep Learning - Object and Action Recognition and Tracking	Research and development of Deep Learning models for real-time object / action recognition and tracking, with the goal of creating a "dynamic map" (DM) from the UAV perspective. DM-based services incl. advanced surveillance, security and generally, situational awareness. The system will be tested by superchip on drone. We already have several running models.	www.siliconmountain.jp	Helmut Prendinger	Professor	Master and PhD students		4-6 months	Solid programming skills, e.g., C++ and Python. Solid background in machine learning and Deep Learning. Longer stay (6 months) is preferred for good result and possibly a publication (http://research.nii.ac.jp/~prendinger/)

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92	Deep Learning - Infrastructure Degradation Classification	Research and development of Deep Learning models for detecting the type and level of damage of infrastructure. We have a large-scale data set of damaged components of bridges in Japan. The project is a collaborative work with academia, industry, and local government.	www.siliconmountain.jp	Helmut Prendinger	Professor	Master and PhD students		4-6 months	Solid programming skills, e.g., C++ and Python. Solid background in machine learning and Deep Learning. Longer stay (6 months) is preferred for good result and possibly a publication (http://research.nii.ac.jp/~prendinger/)
4. Information and Society Research Division									
93	Media Clones	Development of methods for protecting the privacy, biological, and environmental information to prevent fake information generation.	http://www2c.comm.eng.osaka-u.ac.jp/proj/mc/eindex.html http://research.nii.ac.jp/~iechizen/official/achievements-e.html	Isao Echizen	Professor	Master's or PhD students	3	3 to 6 months	
94	Media Clones	Verification of the capability of generating various types of media clones such as audio, visual, text, and social media derived from the fake information.	http://www2c.comm.eng.osaka-u.ac.jp/proj/mc/eindex.html http://research.nii.ac.jp/~iechizen/official/achievements-e.html	Isao Echizen	Professor	Master's or PhD students		3 to 6 months	
95	Security	Fundamental techniques and systems for content security	http://research.nii.ac.jp/~iechizen/official/research-e.html http://research.nii.ac.jp/~iechizen/official/achievements-e.html	Isao Echizen	Professor	Master's or PhD students		3 to 6 months	
96	Privacy	Privacy-enhancing technologies for resolving trade-offs between data anonymity and utility	http://research.nii.ac.jp/~iechizen/official/research-e.html http://research.nii.ac.jp/~iechizen/official/achievements-e.html	Isao Echizen	Professor	Master's or PhD students		3 to 6 months	
97	Image and speech processing	Audiovisual speaker conversion based on deep learning	F. Fang et al. "High-quality nonparallel voice conversion based on cycle-consistent adversarial network," ICASSP, 2018. https://nii-yamagishilab.github.io/avsc/index.html	Isao Echizen	Professor	PhD students		3 to 6 months	

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98	Interactive Information Retrieval	Understanding and Modeling User Behaviour during Complex Search Task	The current project page has not been set up, but the previous related project page is available at; http://cres.jpn.org/?FrontPage	Noriko Kando	Professor	Either Master and PhD students are fine, but priority will be given to PhD student	6	6 months	The grand target of the project is to propose a mechanism to support the users conducting complex/exploratory search tasks. As a step toward the target, several internship research tasks are prepared as following, but not limited to: 1) enhance the method to assess the "success" of complex/exploratory search outcome based on Concept map and others, 2) investigate user search bahaviour in terms of dwell time, link depth, search trail, , engagement, perceived task difficulty, cognitive task complexity, and/or outcome, 3) investigate the relationship between user's attributes such as domain expertise, task familiarity, time constraint, etc. and the search behaviour and outcomes, 4) building and/or enhancing the tools usable for the above mentioned 1) -3). Any other topic related to this research direction shall be considered.
99	Interactive Information Retrieval	Investigating what/how Concept map captures each user's search outcome and its influence on the search process		Noriko Kando	Professor	Either Master and PhD students		6 months	Concept map is originally used in the educational science, but it has been used as a tool to capture each user's knowledge structure change during a complex search task such as "search as learning". This project investigates the role of the concept map in the search process through the experiments
100	Interactive Information Retrieval and Human Computer Interaction	Research and Developing a lifelog camera- or a sensor- based method to enhance the interaction between in-building museum visitor and artifacts displayed at Museum. Use iPadPro 2018.	Enhance a functionality of detailed interaction between visitor and exhibits using lifelog-cameras or any other light-weight sensoring devices.	Noriko Kando	Professor	Either Master and PhD students		6 months	Enhance the interaction functionality of the current prototype system of an interactive exploratory user guide using ipadPro 2018. For the sensors, the current prototype system using iBeacons, and this project will investigate and try tother mechanisms to sense and identify user's behaviour in the museum.
101	Human computer Interaction, Design	Design method of the postcard which containing the images of the artifacts that the visitor observed in the visit, based on each visitor's behaviour in the museum	To enhance the prototype Interactive user guide system for Museum, this project , and 2) conduct user experiment to obtain the feedback to improve the design 1) design the effective and attractive layout of the images of the museum objects for a postcard for each visitor, based on each visitor's behaviour in the museum visit.	Noriko Kando	Professor	Either Master and PhD students		6 months	Related to the above-mentioned #3 project.

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102	Argument Mining / Argument Summarization / Argument Structure Analysis	(1) Argument Mining / Argument Summarization / Argument Structure Analysis, or (2) Sentiment Analysis	https://poliinfo.github.io/	Noriko Kando	Professor	Either Master and PhD students		6 months	Regarding a challenge on political information analysis in the NTCIR's QA Lab shared task series and JSPS Funded Project on Stance Analysis, this project aims 1) survey of the exisiting literature on argument analysis (mining, summarization, structure analysis), 2) propose system(s) for automatic argument analysis / mining / summarization using either a) NTCIR-14 Polinfo Corpus (Japanese), or b) any other corpus in English. For (2) Sentiment analysis
103	Citation analysis	Citation analysis of the "Information Retrieval" domain		Noriko Kando	Professor	Either Master and PhD students		6 months	To analyse the structure of research area of Information Retrieval (IR) and Interactive Information Retrieval (IIR) using various citation analysis methods including co-citation mapping. Compare the analysis published in 1991*, analyse how the domain had been developped over the three decades [NB: * Noriko Kando et al (1991) "Structure of Information Retrieval Research: Tracking the Specialties and Develpment of Research Using Co-citation Maps and Citation Diagrams"

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5. Management and Outside Collaboration on R&D									
104	Data Mining / Machine Learning	Anomaly Detection and Intrinsic Dimensionality	https://www.dropbox.com/s/wokjllg5qfyykua/proj-anomaly-detection.pdf?dl=0	Michael Houle	Visiting Professor	Either	6	4-6 months	Priority given to PhD students, and for internships of 6 months. Shorter internships (2-3 months) are possible for students who are already collaborators.
105	Data Mining / Machine Learning	Classification and Intrinsic Dimensionality	https://www.dropbox.com/s/ltyb63zm0f46wru/proj-classification.pdf?dl=0	Michael Houle	Visiting Professor	Either		4-6 months	Priority given to PhD students, and for internships of 6 months. Shorter internships (2-3 months) are possible for students who are already collaborators.
106	Data Mining / Machine Learning	Feature Selection and Intrinsic Dimensionality	https://www.dropbox.com/s/cpgsxqosk5jd6tf/proj-feature-selection.pdf?dl=0	Michael Houle	Visiting Professor	Either		4-6 months	Priority given to PhD students, and for internships of 6 months. Shorter internships (2-3 months) are possible for students who are already collaborators.
107	Databases / Data Mining	Similarity Search and Intrinsic Dimensionality	https://www.dropbox.com/s/3lk6rhfs5nezseu/proj-similarity-search.pdf?dl=0	Michael Houle	Visiting Professor	Either		4-6 months	Priority given to PhD students, and for internships of 6 months. Shorter internships (2-3 months) are possible for students who are already collaborators.
108	Data Mining	Subspace Clustering and Intrinsic Dimensionality	https://www.dropbox.com/s/e2si6kct5l6o4nk/proj-subspace-clustering.pdf?dl=0	Michael Houle	Visiting Professor	Either		4-6 months	Priority given to PhD students, and for internships of 6 months. Shorter internships (2-3 months) are possible for students who are already collaborators.
109	Theory (Algorithmics, Statistics, Machine Learning)	Theory of Intrinsic Dimensionality	https://www.dropbox.com/s/punl3fqlkek0xh2/proj-theory-of-ID.pdf?dl=0	Michael Houle	Visiting Professor	Either		4-6 months	Priority given to PhD students, and for internships of 6 months. Shorter internships (2-3 months) are possible for students who are already collaborators.