List of research topics for NII International Internship Program 2018 2nd 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	Constant-Time Algorithms on Real Data	http://research.nii.ac.jp/~yyoshida/	Yuichi Yoshida	Associate Professor	PhD students	2	2-6 months	
3	Theoretical Computer Science	Spectral Submodular Theory	http://research.nii.ac.jp/~yyoshida/	Yuichi Yoshida	Associate Professor	PhD students		2-6 months	
4	Machine Learning/Statistics	Statistics from the Perspective of Constant-Time Algorithms	http://research.nii.ac.jp/~yyoshida/	Yuichi Yoshida	Associate Professor	PhD students		2-6 months	
5	Juris-informatics	Legal reasoning		Ken Satoh	Professor	PhD students	3	Up to 3 months	Legal knowledge required
6	Juris-informatics	Legal argumentation		Ken Satoh	Professor	PhD students		Up to 3 month	Knowledge of argumentation semantics in AI is required.
7	Medical Informatics	Argumentation in clinical guidelines		Ken Satoh	Professor	PhD students		Up to 3 month	Knowledge about medical clinical guideline is necessary
8	Argumentation	Argument acquisition		Ken Satoh	Professor	PhD students		Up to 3 month	Knowledge of argumentation theory in AI is required.
9	Knowledge Representation and Reasoning	Tensor-Based Automated Reasoning	http://research.nii.ac.jp/il/	Katsumi Inoue	Professor	Master's or PhD students	4	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.
10	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.
11	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.
12	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.

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13	Control Theory	Encrypted control systems (theory)	https://researchmap.jp/m.kishida/?lang=english	Masako Kishida	Associate Professor	PhD students	1	3 months	The topic can be negotiated
14	Control Application	Building a physical encrypted control system using Raspberry Pi	https://researchmap.jp/m.kishida/?lang=english	Masako Kishida	Associate Professor	Master's or PhD students		2 months	Experience with Raspberry Pi is required
15	Control Theory	Event-triggered/Self-triggered controls (theory)	https://researchmap.jp/m.kishida/?lang=english	Masako Kishida	Associate Professor	PhD students		3 months	The topic can be negotiated
16	Artificial Intelligence	Machine Learning for Advanced Driving Assistance Systems	http://ri-www.nii.ac.jp/	Ryutaro Ichise	Associate Professor	Master's or PhD students	4	3-6 months	
17	Artificial Intelligence	Knowledge Graph / Linked Data	http://ri-www.nii.ac.jp/	Ryutaro Ichise	Associate Professor	Master's or PhD students		3-6 months	
18	Artificial Intelligence	Data Mining for Large Scale Data	http://ri-www.nii.ac.jp/	Ryutaro Ichise	Associate Professor	Master's or PhD students		3-6 months	
19	Artificial Intelligence	Ontology Learning / Mapping	http://ri-www.nii.ac.jp/	Ryutaro Ichise	Associate Professor	Master's or PhD students		3-6 months	
20	Numerical Linear Algebra	Randomized algorithms for the iterative solution of systems of linear equations and least square problems.	https://researchmap.jp/KenHayami/ 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.
21	Inverse Problems	Application and improvement of the Modified Cluster Newton method for parameter identification of Pharmacokinetic models and Neuron models.	https://researchmap.jp/KenHayami/ https://arxiv.org/abs/1808.06714	Ken Hayami	Professor	Master's or PhD students		6 months	Basic knowledge of numerical analysis is desirable.
22	Numerical Linear Algebra	Eigenvalue problems and linear systems	https://www.opt.mist.i.u-tokyo.ac.jp/~nakatsukasa/	Yuji Nakatsukasa	Associate Professor	Master's or PhD students	4	2-6 months	
23	Linear Algebra and Statistics	Applying linear algebra techniques to statistical problems	https://www.opt.mist.i.u-tokyo.ac.jp/~nakatsukasa/	Yuji Nakatsukasa	Associate Professor	Master's or PhD students		2-6 months	
24	Optimization	Efficient solution of continuous optimization problems	https://www.opt.mist.i.u-tokyo.ac.jp/~nakatsukasa/	Yuji Nakatsukasa	Associate Professor	Master's or PhD students		2-6 months	
25	Numerical Analysis	Function approximation, integration, differential equations	https://www.opt.mist.i.u-tokyo.ac.jp/~nakatsukasa/	Yuji Nakatsukasa	Associate Professor	Master's or PhD students		2-6 months	

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26	Machine learning	Machine learning with discrete structure	http://mahito.info/index_e.html	Mahito Sugiyama	Associate Professor	PhD students	2	6 months	
27	Machine learning	Machine learning with information geometry	http://mahito.info/index_e.html	Mahito Sugiyama	Associate Professor	PhD students		6 months	
28	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	3-6 months	Basic knowledge about Probability and Statistics (e.g. Chapter 1 and 2 in Pattern Recognition and Machine Learning, Bishop C.M.) 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).
29	Computational Neuroscience, Simulation	Brain simulation	http://research.nii.ac.jp/~r-koba/en/index.html	Ryota Kobayashi	Assistant Professor	PhD students		3-6 months	Basic knowledge about differential equations are necessary. Optimization or simulation methods for differential equations will be appreciated.
30	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	
31	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	
32	Artificial Intelligence	Artificial Social Intelligence: building intelligence systems with social knowledge and social interaction	http://www-kasm.nii.ac.jp/	Hideaki Takeda	Professor	Master's or PhD students		3-6months	
33	Intelligent Robotics	Human-Robot Interaction in Virtual/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	
2. Information Systems Architecture Science Research Division									
34	Programming Technique	Bidirectional Programming/Bidirectional Transformation	http://research.nii.ac.jp/~hu http://www.prg.nii.ac.jp	Zhenjiang Hu	Professor	Master's or PhD students	3	3-6 months	Interested in functional programming and compiler construction
35	Database	Data Sharing and Data Integration	http://research.nii.ac.jp/~hu http://www.prg.nii.ac.jp	Zhenjiang Hu	Professor	Master's or PhD students		3-6 months	Interested in developing practical systems for data sharing and data integration
36	Parallel Programming	Efficient Porcessing of Big Graphs	http://research.nii.ac.jp/~hu http://www.prg.nii.ac.jp	Zhenjiang Hu	Professor	Master's or PhD students		3-6 months	Having experiences of writing parallel programs
37	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	4	6 months (or shorter)	Our focus will be on quantitative modeling and verification (probabilistic, weighted, timed, etc.). Desired: solid backgrounds in logic, automata and formal languages

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38	Software Science	Machine Learning Techniques 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.
39	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.
40	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.
41	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.
42	Cyber Security	Development of analysis tool for cyber attack information	https://www.nii.ac.jp/en/faculty/architecture/takakura_hiroki/	Hiroki Takakura	Professor	Master's or PhD students	1	3-6 months	Basic knowledge on network devices, servers, communication protocols, and cyber attack countermeasure equipment (IDS/IPS etc.). Knowledge of countermeasures against cyber attacks and vulnerability of information systems, as well as machine learning and statistical processing is desirable. Basic knowledge on network devices, servers, communication protocols, and cyber attack countermeasure equipment (IDS/IPS etc.). Knowledge of countermeasures against cyber attacks and vulnerability of information systems, as well as machine learning and statistical processing is desirable.
43	Database Programming Languages	XQuery Fusion	http://research.nii.ac.jp/~kato/kato/Top.html	Hiroyuki Kato	Assistant Professor	Master's or PhD students	2	2-6 months	
44	Wireless and Mobile Communication Networks, Machine Learning	Learning and prediction-based dynamic radio resource allocation optimization	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.
45	Wireless and Mobile Communication Networks	Energy harvesting for 5G/IoT Low Power Wide Area Networks (LPWAN) systems	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 is required.
46	Wireless and Mobile Communication Networks	Radio access protocol design for drone (UAV) networks using mmWave Massive MIMO	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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47	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
48	Computer network	Cryptocurrency transaction analysis	http://www.fukuda-lab.org	Kensuke Fukuda	Associate Professor	Master's or PhD students		5 or 6 months	Solid programming skill in python and knowledge on cryptocurrency
49	Computer network	Syslog causality analysis	http://www.fukuda-lab.org	Kensuke Fukuda	Associate Professor	Master's or PhD students		5 or 6 months	Solid programming skill in python
50	Computer network	Network security	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
51	Software Engineering, Machine Learning, Testing, Artificial Intelligence	Testing and Quality Analysis of Machine 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	
52	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	
53	Formal Methods, Software Engineering	Incremental Development and Evolution for Refinement-based System Models	http://research.nii.ac.jp/~f-ishikawa/en/lab.html	Fuyuki Ishikawa	Associate Professor	Master's or PhD students		2-6 months	
54	Software Engineering, Self-Adaptive Systems, Internet-of-Things	Runtime Validation and Configuration of Smart Space Systems	http://research.nii.ac.jp/~f-ishikawa/en/lab.html	Fuyuki Ishikawa	Associate Professor	Master's or PhD students		2-6 months	
55	Hardware Design	Hardware Implementation of Neural Networks	http://www.nii.ac.jp/en/faculty/architecture/yoneda_tomohiro/	Tomohiro Yoneda	Professor	Master's or PhD students	1	6 months	
56	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.
57	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.
58	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	
59	Wireless networking	5G, Connected Vehicles, IoT	http://klab.nii.ac.jp/	Yusheng Ji	Professor	Master or Ph.D students	4	3 to 6 months	Understanding of infrastructure-based and/or ad hoc wireless communication systems is expected

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60	Mobile computing	Mobile edge computing	http://klab.nii.ac.jp/	Yusheng Ji	Professor	Master's or PhD students		3 to 6 months	Understanding of infrastructure-based and/or ad hoc wireless communication systems is expected
3. Digital Content and Media Sciences Research Division									
61	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	Assistant 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. .
62	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	Assistant 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. .
63	Traditional Photometric Computer Vision	Multispectral and Hyperspectral Imaging System; Spectral Image Denosing and Superresolution; Intrinsic Images; Polarizing Imaging;	http://researchmap.jp/yinqiangzheng	Yinqiang Zheng	Assistant 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. .
64	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	Assistant 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. .
65	Computer vision	One of the following topics: (1) 3D vision, (2) Human activity recognition, (3) Gaze sensing and navigation, (4) Object segmentation from video, and (5) Image/video generation	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.
66	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.
67	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	
68	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	
69	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 Ph.D Student		More than 90 days	

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70	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-	http://www.satoh-lab.nii.ac.jp	Shin'ichi Satoh	Professor	Master's or Ph.D Student		More than 90 days	
71	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/PhD	4	3-6months	
72	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	http://research.nii.ac.jp/~yiyu/	Yi Yu	Assistant Professor	Master/PhD		3-6months	
73	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	Associate 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
74	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, Jaime Lorenzo-Trueba, Shinji Takaki, Lauri Juvela, Junichi Yamagishi, A COMPARISON OF RECENT WAVEFORM GENERATION AND ACOUSTIC MODELING METHODS FOR NEURAL-NETWORK-BASED SPEECH SYNTHESIS ICASSP 2018, April 2018 and [3] Lauri Juvela, Vassilis Tsiaras, Bajibabu Bollepalli, Manu Airaksinen, Junichi Yamagishi, Paavo Alku, Speaker-independent raw waveform model for glottal excitation Interspeech 2018, Sept 2018	Junichi Yamagishi	Associate 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
75	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" ArXiv August 2018	Junichi Yamagishi	Associate 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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76	Speech information processing	Automatic speaker verifications and its anti-spoofing	Relevant papers and webpage include, but do not limited to, [5] Tomi Kinnunen, Md Sahidullah, Hector Delgado, Massimiliano Todisco, Nicholas Evans, Junichi Yamagishi, Kong Aik Lee, The ASVspoof 2017 Challenge: Assessing the Limits of Replay Spoofing Attack Detection. Interspeech Sept 2017 http://www.spoofingchallenge.org/	Junichi Yamagishi	Associate 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
77	Speech information processing	Multi-modal speech processing	Relevant papers include, but do not limited to, [6] Rithesh Kumar, Jose Sotelo, Kundan Kumar, Alexandre de Brebisson, Yoshua Bengio, ObamaNet: Photo-realistic lip-sync from text, ArXiv Dec 2017	Junichi Yamagishi	Associate 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
78	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.
79	Earth Environmental Informatics	Big data analytics (esp. image processing, remote sensing and machine learning) for environmental and societal problems	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.
80	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.
81	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.
82	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)	
83	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)	
84	Text Media	Natural language understanding	http://www-al.nii.ac.jp	Akiko Aizawa	Professor	Master's or PhD students		3-6 months (6 month is preferable)	
85	Social media	Flavorlens social network	https://bit.ly/2LhBhTz	Frederic Andres	Associate Professor	Master	5	6 months	In cooperation with the CRWB project

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86	Data Science	Cooking Execution Plan Generator	https://bit.ly/2w9cfRF	Frederic Andres	Associate Professor	Master/PhD		6 months	International cooperation with the Fun2GPCR project
87	Data Science	Cooking Process-centric ontology	https://bit.ly/2BJmG3C	Frederic Andres	Associate Professor	Master/PhD		6 months	International cooperation with the Fun2GPCR project
88	Data Science/Big Data	Dish and Ingredient recognition	https://bit.ly/2MO4BFW	Frederic Andres	Associate Professor	Master/PhD		6 months	In cooperation with the MyPoc Project
89	IT/Education science	WebRTC-based WebELS Server	https://bit.ly/2o5hZYr	Frederic Andres	Associate Professor	Master/PhD		6 months	In international cooperation with the WebELS project
90	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 knowledge 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/)
91	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/)
92	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/)

List of research topics for NII International Internship Program 2018 2nd 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
93	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/)
94	Text mining	Text mining based on probabilistic model	http://www.ldear.nii.ac.jp/~takasu/en/	Atsuhiro Takasu	Professor	Master's or PhD students	3	3 – 6 months	
95	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	
96	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	3	5 to 6 month	A basic knowledge of Image Analysis and/or Machine learning, and good programming skills are required
4. Information and Society Research Division									
97	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	4	3 to 6 months	
98	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	
99	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	
100	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	
101	Media Clones	Development of methods for speech synthesis and speaker translation using unpaired data.	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	

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102	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 behaviour 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.
103	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
104	Argument Mining / Argument Summarization / Argument Structure Analysis	Argument Mining / Argument Summarization / Argument Structure Analysis	https://poliinfo.github.io/	Noriko Kando	Professor	Either Master and PhD students		6 months	Regarding a new challenge on political information analysis in the NTCIR's QA Lab shared task series, this project aims 1) survey of the existing 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 a), the internship includes hands on tutorials on how to process Japanese text.
105	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 developed over the three decades [NB: * Noriko Kando et al (1991) "Structure of Information Retrieval Research: Tracking the Specialties and Development of Research Using Co-citation Maps and Citation Diagrams"
5. Management and Outside Collaboration on R&D									
106	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.
107	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.

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108	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.
109	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.
110	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.
111	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.