

## List of research topics for NII International Internship Program 2023 1st Call

No.	Research Area	Title of the Research	Website	Name of supervisor	Title of the supervisor	Requirements for Applicants: Master / Ph.D. Student	Total Number of Acceptance per Supervisor	Duration : 2-6months (less than 180days)	Comments
<b>1. Principles of Informatics Research Division</b>									
P00301	Knowledge Representation and Reasoning	Integration of Knowledge Representation and Machine Learning	<a href="http://research.nii.ac.jp/il/">http://research.nii.ac.jp/il/</a>	Katsumi Inoue	Professor	Master/Ph.D.	2	3 - 6 months	Knowledge in KR&R (e.g., logic programming, SAT, ASP, abduction, belief change, commonsense reasoning) as well as machine learning (e.g., neurosymbolic AI, inductive inference, representation learning) are advantageous to tackle this subject. Experience in algebraic computation is useful too. Contact Prof. Inoue in advance.
P00302	Knowledge Representation and Reasoning	Discovery, Inference and Learning about Dynamic Systems	<a href="http://research.nii.ac.jp/il/">http://research.nii.ac.jp/il/</a>	Katsumi Inoue	Professor	Master/Ph.D.	2	3 - 6 months	Basic knowledge of symbolic AI and machine learning is required. Interests and experiences in topics such as Boolean networks, cellular automata, model checking, planning and dynamical systems are welcome. Contact Prof. Inoue in advance.
P01001	AI and Law	Norm Compliance Mechanism		Ken Satoh	Professor	Ph.D.	3	2 - 3 months	
P01002	AI and Law	Legal Reasoning		Ken Satoh	Professor	Ph.D.	3	2 - 3 months	
P01003	AI and Law	Legal Natural Language Processing		Ken Satoh	Professor	Ph.D.	3	2 - 3 months	
P01101	Machine learning	Geometric analysis of machine learning and its relationship to symbolic reasoning	<a href="https://mahito.nii.ac.jp">https://mahito.nii.ac.jp</a>	Mahito Sugiyama	Associate Professor	Ph.D.	2	3 - 6 months	
P01201	Artificial Intelligence / Web Informatics	Semantic Web / Linked Data / Linked Open Data	<a href="http://lod.ac">http://lod.ac</a> <a href="http://www-kasm.nii.ac.jp/~takeda">http://www-kasm.nii.ac.jp/~takeda</a>	Hideaki Takeda	Professor	Master/Ph.D.	3	3 - 6 months	
P01202	Artificial Intelligence	Artificial Social Intelligence: building intelligence systems with social knowledge and social interaction	<a href="http://www-kasm.nii.ac.jp/~takeda">http://www-kasm.nii.ac.jp/~takeda</a>	Hideaki Takeda	Professor	Master/Ph.D.	3	3 - 6 months	
P01301	software verification	separation logic	<a href="http://research.nii.ac.jp/~tatsuta/index-e.html">http://research.nii.ac.jp/~tatsuta/index-e.html</a>	Makoto Tatsuta	Professor	Master/Ph.D.	2	2 - 6 months	
P02001	Theoretical Computer Science Data Mining	Spectral theory for directed graphs, hypergraphs, and submodular transformations.	<a href="https://arxiv.org/abs/2106.02353">https://arxiv.org/abs/2106.02353</a> <a href="https://dl.acm.org/doi/abs/10.1145/3394486.3403248">https://dl.acm.org/doi/abs/10.1145/3394486.3403248</a> <a href="https://arxiv.org/abs/1708.08781">https://arxiv.org/abs/1708.08781</a>	Yuichi Yoshida	Professor	Ph.D.	2	2 - 6 months	
P02002	Theoretical Computer Science Machine Learning	Average sensitivity of optimization problems	<a href="https://arxiv.org/abs/1904.03248">https://arxiv.org/abs/1904.03248</a> <a href="https://arxiv.org/abs/2111.02657">https://arxiv.org/abs/2111.02657</a>	Yuichi Yoshida	Professor	Ph.D.	2	2 - 6 months	
P02003	Theoretical Computer Science	Sublinear-time algorithms	<a href="https://arxiv.org/abs/2204.08404">https://arxiv.org/abs/2204.08404</a> <a href="https://arxiv.org/abs/2210.12601">https://arxiv.org/abs/2210.12601</a>	Yuichi Yoshida	Professor	Ph.D.	2	2 - 6 months	
P02101	Computational Complexity Theory	Meta-complexity, average-case complexity, pseudorandomness, and the Minimum Circuit Size Problem	<a href="https://eccc.weizmann.ac.il/report/2022/119/">https://eccc.weizmann.ac.il/report/2022/119/</a> <a href="https://eccc.weizmann.ac.il/report/2021/058/">https://eccc.weizmann.ac.il/report/2021/058/</a>	Shuichi Hirahara	Associate Professor	Master/Ph.D.	1	2 - 6 months	
P03401	Robotics	Development of humanoid robot		Taisuke Kobayashi	Assistant Professor	Master/Ph.D.	2	4 - 6 months	Design a part of humanoid hardware or develop a software for robot state estimation
P03402	Machine learning	World model for model-based reinforcement learning		Taisuke Kobayashi	Assistant Professor	Master/Ph.D.	2	4 - 6 months	Implement a novel world model for predicting future states on robot control
P03501	Quantum information	Making a general framework to explore large-scale quantum programs		Akihito Soeda	Associate Professor	Master/Ph.D.	2	2 - 6 months	
P03502	Quantum information	Making more accurate physical models to describe quantum information processing devices		Akihito Soeda	Associate Professor	Master/Ph.D.	2	2 - 6 months	

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<b>2. Information Systems Architecture Science Research Division</b>									
A00301	Machine Learning, Deep Learning, Software Engineering, Testing and Debugging	Risk-Aware Debugging Techniques for Deep Neural Networks	<a href="http://research.nii.ac.jp/~f-ishikawa/en/lab.html">http://research.nii.ac.jp/~f-ishikawa/en/lab.html</a>	Fuyuki Ishikawa	Associate Professor	Master/Ph.D.	5	2 - 6 months	
A00302	Software Engineering, Cyber-Physical Systems, Testing and Debugging, Formal Methods	Smart Testing and Debugging for Cyber-Physical and Intelligent Systems	<a href="http://research.nii.ac.jp/~f-ishikawa/en/lab.html">http://research.nii.ac.jp/~f-ishikawa/en/lab.html</a>	Fuyuki Ishikawa	Associate Professor	Master/Ph.D.	5	2 - 6 months	
A00601	Wireless and Mobile Networks, Sensing, Signal Processing, Machine Learning	Energy-efficient edge AI-based wireless networks design for Beyond 5G	<a href="http://research.nii.ac.jp/~megkaneko/">http://research.nii.ac.jp/~megkaneko/</a>	Megumi Kaneko	Associate Professor	Master/Ph.D.	3	4 - 6 months	Required programming skills: Matlab, Python. Basic knowledge in wireless/digital communications and signal processing is required.
A00602	Wireless and Mobile Networks, Sensing, Signal Processing, Machine Learning	Joint wireless communications and sensing for IoT massive connectivity	<a href="http://research.nii.ac.jp/~megkaneko/">http://research.nii.ac.jp/~megkaneko/</a>	Megumi Kaneko	Associate Professor	Master/Ph.D.	3	4 - 6 months	Required programming skills: Matlab, Python. Basic knowledge in wireless/digital communications and signal processing is required.
A00603	Wireless and Mobile Networks, Sensing, Signal Processing, Machine Learning	Integrated terrestrial and spatial wireless communications for Beyond 5G and 6G	<a href="http://research.nii.ac.jp/~megkaneko/">http://research.nii.ac.jp/~megkaneko/</a>	Megumi Kaneko	Associate Professor	Master/Ph.D.	3	4 - 6 months	Required programming skills: Matlab, Python. Basic knowledge in wireless/digital communications and signal processing is required.
A00604	Wireless and Mobile Networks, Sensing, Signal Processing, Machine Learning	Exploiting TeraHertz bands for 6G wireless communications and sensing	<a href="http://research.nii.ac.jp/~megkaneko/">http://research.nii.ac.jp/~megkaneko/</a>	Megumi Kaneko	Associate Professor	Master/Ph.D.	3	4 - 6 months	Required programming skills: Matlab, Python. Basic knowledge in wireless/digital communications and signal processing is required.
A00801	Wireless communication	Resource management in beyond 5G and 6G wireless networks	<a href="https://klab.nii.ac.jp">https://klab.nii.ac.jp</a>	Yusheng Ji	Professor	Master/Ph.D.	3	3 - 6 months	Understanding of wireless communications and basic knowledge on optimization are required.
A00802	Networking	AI/ML for networking	<a href="https://klab.nii.ac.jp">https://klab.nii.ac.jp</a>	Yusheng Ji	Professor	Master/Ph.D.	3	3 - 6 months	Experience in machine learning (deep learning, reinforcement learning, or federated learning etc.) is preferred.
A00803	IoT	Wireless sensing	<a href="https://klab.nii.ac.jp">https://klab.nii.ac.jp</a>	Yusheng Ji	Professor	Master/Ph.D.	3	3 - 6 months	Knowledge and experience on RF sensing is required.
A01201	Programming Languages / Program Verification	Advanced Type Systems for Computational Effects	<a href="https://researchmap.jp/t-sekiym?lang=en">https://researchmap.jp/t-sekiym?lang=en</a> <a href="https://dl.acm.org/doi/abs/10.1145/3571264">https://dl.acm.org/doi/abs/10.1145/3571264</a>	Taro Sekiyama	Assistant Professor	Master/Ph.D.	3	3 - 6 months	Computational effects are a key factor for effectful programming, being able to be implemented using, e.g., monads, control operators, and effect handlers. This research aims to develop advanced type systems, such as dependent type systems, for the effectful constructs.
A01202	Program Verification	Program Verification with Machine Learning	<a href="https://researchmap.jp/t-sekiym?lang=en">https://researchmap.jp/t-sekiym?lang=en</a> <a href="https://arxiv.org/abs/2107.09766">https://arxiv.org/abs/2107.09766</a>	Taro Sekiyama	Assistant Professor	Master/Ph.D.	3	2 - 6 months	This internship program aims to apply machine learning techniques, including reinforcement learning and text-processing methods, to speed up program verification process.
A01203	Programming Languages / Program Verification	Type-Based Temporal Verification and Its Automation	<a href="https://researchmap.jp/t-sekiym?lang=en">https://researchmap.jp/t-sekiym?lang=en</a> <a href="https://dl.acm.org/doi/10.1145/3209108.3209204">https://dl.acm.org/doi/10.1145/3209108.3209204</a> <a href="https://dl.acm.org/doi/abs/10.1145/3571264">https://dl.acm.org/doi/abs/10.1145/3571264</a>	Taro Sekiyama	Assistant Professor	Master/Ph.D.	3	3 - 6 months	Temporal verification aims to verify safety and liveness temporal properties of programs, including how computation resources are used. This research aims to develop (1) advanced type systems for temporal verification in the presence of a variety of programming features such as recursion, references, and any other effects, and (2) procedures to automate the type-based temporal verification.

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A01701	Theoretical Computer Science	Categorical Foundation of Model Checking	<a href="https://group-mmm.org/~ichiro/">https://group-mmm.org/~ichiro/</a>	Ichiro Hasuo	Professor	Master/Ph.D.	2	2 - 6 months	<p>## Fixed-point specifications (such as in LTL and modal <math>\mu</math>-calculus) have been conventionally studied in terms of finitary and combinatory structures (automata, games, etc.). These observations are recently being transferred to more abstract settings, opening up algorithms and proof methods for new application domains (esp. probabilistic, metric, etc.). There are a number of research questions waiting to be answered, both theoretical and algorithmic.</p> <p>## References: [Komorida, Katsumata, Hu, Klin, Hasuo, LICS'19], [Komorida, Katsumata, Kupke, Rot, Hasuo, LICS'21], [Kori, Hasuo, Katsumata, CONCUR'21], [Kori, Urabe, Katsumata, Suenaga, Hasuo, CAV'22]</p> <p>## Desired: familiarity with mathematical and abstract reasoning used in logic, lattice theory and (possibly) category theory</p> <p>## Interested? Please first consult <a href="https://group-mmm.org/eratommmsd/internship-students/">https://group-mmm.org/eratommmsd/internship-students/</a> (don't write an email to me)</p>
A01702	Theoretical Computer Science	Logical guidance in optimization metaheuristics	<a href="https://group-mmm.org/~ichiro/">https://group-mmm.org/~ichiro/</a>	Ichiro Hasuo	Professor	Master/Ph.D.	2	2 - 6 months	<p>## Many real-world optimization problems have inherent logical and discrete structures, but many optimization metaheuristics (stochastic optimization, hill-climbing, evolutionary computation, etc.) do not make explicit use of such structures. We have used hierarchical optimization frameworks where the upper logical layer guides the lower metaheuristics layer for efficiency and explainability. The goal is to push the idea further in other applications and theoretical foundations.</p> <p>## References: [Zhang, Hasuo, Arcaini, CAV'19], [Zhang, Ernst, Sedwards, Arcaini, Hasuo, EMSOFT'18]</p> <p>## Desired: familiarity with, or eagerness to learn, 1) formal logic, 2) optimization metaheuristics, 3) statistical machine learning</p> <p>## Interested? Please first consult <a href="https://group-mmm.org/eratommmsd/internship-students/">https://group-mmm.org/eratommmsd/internship-students/</a> (don't write an email to me)</p>
A01703	Theoretical Computer Science	Logical safety for automated driving	<a href="https://group-mmm.org/~ichiro/">https://group-mmm.org/~ichiro/</a>	Ichiro Hasuo	Professor	Master/Ph.D.	2	2 - 6 months	<p>## Responsibility-sensitive safety (RSS) is a recently proposed methodology for devising mathematically-guaranteed safety rules for automated driving. The candidate will work on its logical foundations and its application to various driving scenarios. The work is much like interactive theorem proving, but with unique theoretical challenges (e.g. continuous dynamics) and a hot application (automated driving).</p> <p>## References: [Hasuo, Eberhart, Haydon, et al., IEEE Trans. Intelligent Vehicles, '22 (available at arXiv)] [Shalev-Shwartz, Shammah, Shashua, arXiv'17]</p> <p>## Desired: familiarity with formal logic and interactive theorem proving, passion in bringing theory to practice</p> <p>## Interested? Please first consult <a href="https://group-mmm.org/eratommmsd/internship-students/">https://group-mmm.org/eratommmsd/internship-students/</a> (don't write an email to me)</p>

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A01801	Computer network	Internet/IoT traffic anomaly detection	<a href="http://www.flab.nii.ac.jp/internship">http://www.flab.nii.ac.jp/internship</a>	Kensuke Fukuda	Associate Professor	Master	4	5 - 6 months	Solid programming and machine learning skills
A01802	Computer network	Network config mining / Network verification	<a href="http://www.flab.nii.ac.jp/internship">http://www.flab.nii.ac.jp/internship</a>	Kensuke Fukuda	Associate Professor	Master/Ph.D.	4	5 - 6 months	Solid programming (python) and machine learning skills
A01803	Computer network	Network security measurement and analysis	<a href="http://www.flab.nii.ac.jp/internship">http://www.flab.nii.ac.jp/internship</a>	Kensuke Fukuda	Associate Professor	Master/Ph.D.	4	5 - 6 months	Solid programming (python or C++) and machine learning skills
A01804	Computer network	Web privacy measurement	<a href="http://www.flab.nii.ac.jp/internship">http://www.flab.nii.ac.jp/internship</a>	Kensuke Fukuda	Associate Professor	Master/Ph.D.	4	5 - 6 months	Solid programming skill (python or javascript)

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<b>3. Digital Content and Media Sciences Research Division</b>									
K00101	Text Media	Language Models and their applications to assist human activities	<a href="http://www-al.nii.ac.jp">http://www-al.nii.ac.jp</a>	Akiko Aizawa	Professor	Master/Ph.D.	4	3 - 6 months	
K00102	Text Media	Deep analysis of scientific papers	<a href="http://www-al.nii.ac.jp">http://www-al.nii.ac.jp</a>	Akiko Aizawa	Professor	Master/Ph.D.	4	3 - 6 months	
K00103	Text Media	Mathematical language processing	<a href="http://www-al.nii.ac.jp">http://www-al.nii.ac.jp</a>	Akiko Aizawa	Professor	Master/Ph.D.	4	3 - 6 months	
K00401	Education	Ontology based Approach for compliance with student privacy protection requirements in Education	<a href="http://research.nii.ac.jp/~andres/official/intern2023_ON_SITE_topic_1.html">http://research.nii.ac.jp/~andres/official/intern2023_ON_SITE_topic_1.html</a>	Frederic ANDRES	Associate Professor	Master/Ph.D.	3	6 months	Collaboration with ISO standardisation SC36 experts
K00402	Business intelligence	AI-driven customer intelligence	<a href="http://research.nii.ac.jp/~andres/official/intern2023_ON_SITE_topic_2.html">http://research.nii.ac.jp/~andres/official/intern2023_ON_SITE_topic_2.html</a>	Frederic ANDRES	Associate Professor	Master/Ph.D.	3	6 months	Collaboration with the largest travel company in Japan
K00403	data science, water quality	Water Crystal classification benchmark	<a href="http://research.nii.ac.jp/~andres/official/intern2023_ON_SITE_topic_3.html">http://research.nii.ac.jp/~andres/official/intern2023_ON_SITE_topic_3.html</a>	Frederic ANDRES	Associate Professor	Master/Ph.D.	3	6 months	collaboration with the Emoto research Lab
K00404	Data Science, Food Science	cooking recipes without border (CRWB) project	<a href="http://research.nii.ac.jp/~andres/official/intern2023_ON_SITE_topic_4.html">http://research.nii.ac.jp/~andres/official/intern2023_ON_SITE_topic_4.html</a>	Frederic ANDRES	Associate Professor	Master/Ph.D.	3	6 months	collaboration with IEEE and ISO data science
K00405	Data science, education science	Affective Learning Monitoring Platform as a Service (ALMPaaS)	<a href="http://research.nii.ac.jp/~andres/official/intern2023_ON_SITE_topic_5.html">http://research.nii.ac.jp/~andres/official/intern2023_ON_SITE_topic_5.html</a>	Frederic ANDRES	Associate Professor	Master/Ph.D.	3	6 months	collaboration with Darwin university and Cardiff University
K00501	3-D computer vision	Professional-grade image-based 3D reconstruction in the wild	<a href="https://satoshi-ikehata.github.io/">https://satoshi-ikehata.github.io/</a>	Satoshi Ikehata	Assistant Professor	Ph.D.	1	3 - 6 months	In this project, we explore a method for performing professional-grade (industry-available) image-based shape and reflectance recovery in the wild, primarily using the photometric stereo technique. Basic knowledge and interest in 3D computer vision and physics-based vision are desirable, as well as experience with Python coding and basic concepts of deep learning.
K01001	Digital Humanities	Machine learning for image processing (esp. character recognition), geographic information, linked data, and metadata management for cultural heritage	<a href="http://agora.ex.nii.ac.jp/~kitamoto/education/internship/">http://agora.ex.nii.ac.jp/~kitamoto/education/internship/</a>	Asanobu Kitamoto	Professor	Master/Ph.D.	4	3 - 6 months	
K01002	Earth Environmental Informatics	Big data analytics (esp. image processing, remote sensing, and machine learning) for societal problems such as environment and sustainability	<a href="http://agora.ex.nii.ac.jp/~kitamoto/education/internship/">http://agora.ex.nii.ac.jp/~kitamoto/education/internship/</a>	Asanobu Kitamoto	Professor	Master/Ph.D.	4	3 - 6 months	
K01003	Crisis Informatics	Big data analytics (esp. image processing, natural language processing, and machine learning) for natural disasters and crisis	<a href="http://agora.ex.nii.ac.jp/~kitamoto/education/internship/">http://agora.ex.nii.ac.jp/~kitamoto/education/internship/</a>	Asanobu Kitamoto	Professor	Master/Ph.D.	4	3 - 6 months	
K01004	Open Science	Research on new trends in open science, such as open data, data citation, citizen science, and open innovation	<a href="http://agora.ex.nii.ac.jp/~kitamoto/education/internship/">http://agora.ex.nii.ac.jp/~kitamoto/education/internship/</a>	Asanobu Kitamoto	Professor	Master/Ph.D.	4	3 - 6 months	
K01401	Content-Based Image and Video Analysis	video and image search (esp. TRECVID AVS task. see: <a href="https://trecvid.nist.gov/">https://trecvid.nist.gov/</a> )	<a href="http://www.satoh-lab.nii.ac.jp/">http://www.satoh-lab.nii.ac.jp/</a>	Shin'ichi Satoh	Professor	Master/Ph.D.	5	3 - 6 months	
K01402	Content-Based Image and Video Analysis	Automatic question answering about videos (esp. TRECVID Deep Video Understanding (DVU). see: <a href="https://trecvid.nist.gov/">https://trecvid.nist.gov/</a> )	<a href="http://www.satoh-lab.nii.ac.jp/">http://www.satoh-lab.nii.ac.jp/</a>	Shin'ichi Satoh	Professor	Master/Ph.D.	5	3 - 6 months	
K01403	Content-Based image and Video Analysis	Video/image captioning (esp. TRECVID Video to Text (VTT) task. see: <a href="https://trecvid.nist.gov/">https://trecvid.nist.gov/</a> )	<a href="http://www.satoh-lab.nii.ac.jp/">http://www.satoh-lab.nii.ac.jp/</a>	Shin'ichi Satoh	Professor	Master/Ph.D.	5	3 - 6 months	
K01404	Content-Based Image and Video Analysis	Landmark image retrieval, e.g., Google Landmark Image Retrieval <a href="https://www.kaggle.com/c/landmark-retrieval-2020">https://www.kaggle.com/c/landmark-retrieval-2020</a> .	<a href="http://www.satoh-lab.nii.ac.jp/">http://www.satoh-lab.nii.ac.jp/</a>	Shin'ichi Satoh	Professor	Master/Ph.D.	5	3 - 6 months	

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K01601	computer vision	One of the following topics (but not limited to): (1) 3D vision, (2) Human activity recognition, (3) Gaze sensing and navigation, (4) Object detection and segmentation from video using deep learning,  (5) Image/video generation using deep learning.	<a href="http://www.dgcv.nii.ac.jp">http://www.dgcv.nii.ac.jp</a>	Akihiro Sugimoto	Professor	Master/Ph.D.	5	3 - 6 months	Longer duration 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 pursue 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.
K01602	digital geometry	(1) Discretization model of geometric shape, (2) Discrete shape fitting to noisy integer points, (3) Any proposed topic related with digital geometry.	<a href="http://www.dgcv.nii.ac.jp">http://www.dgcv.nii.ac.jp</a>	Akihiro Sugimoto	Professor	Master/Ph.D.	5	3 - 6 months	Rigorous background on mathematics as well as computer vision is required. In particular, strong knowledge on linear algebra, graph theory, and number theory is 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.
K01701	Data Mining	recommender system	<a href="https://www.tlab.nii.ac.jp">https://www.tlab.nii.ac.jp</a>	Atsuhiko Takasu	Professor	Master/Ph.D.	4	4 - 6 months	
K01702	Data Mining	Tabular Data Recognition and Analysis	<a href="https://www.tlab.nii.ac.jp">https://www.tlab.nii.ac.jp</a>	Atsuhiko Takasu	Professor	Master/Ph.D.	4	4 - 6 months	
K01703	Data Mining	Sequence Data Mining	<a href="https://www.tlab.nii.ac.jp">https://www.tlab.nii.ac.jp</a>	Atsuhiko Takasu	Professor	Master/Ph.D.	4	4 - 6 months	
K02001	Deep Learning	High-Speed Object Detection and Tracking onboard a Drone	<a href="http://research.nii.ac.jp/~prendinger/papers/FY2023(1)_Topics.html">http://research.nii.ac.jp/~prendinger/papers/FY2023(1)_Topics.html</a>	Helmut PRENDINGER	Professor	Master/Ph.D.	8	4 - 6 months	Longer stay is preferred for solid result.
K02002	Deep Learning/Machine Learning/Cointegration	Time Series Analysis for Bitcoin Market Prediction	<a href="http://research.nii.ac.jp/~prendinger/papers/FY2023(1)_Topics.html">http://research.nii.ac.jp/~prendinger/papers/FY2023(1)_Topics.html</a>	Helmut PRENDINGER	Professor	Master/Ph.D.	8	4 - 6 months	Longer stay is preferred for solid result.
K02003	Deep Learning	Transformer-based Conditional Generative Models	<a href="http://research.nii.ac.jp/~prendinger/papers/FY2023(1)_Topics.html">http://research.nii.ac.jp/~prendinger/papers/FY2023(1)_Topics.html</a>	Helmut PRENDINGER	Professor	Master/Ph.D.	8	4 - 6 months	Longer stay is preferred for solid result.
K02301	Speech processing	Differentiable digital signal processing with applications to speech audio generation	"Relevant but not limited to [1] WaveGrad <a href="https://arxiv.org/abs/2009.00713">https://arxiv.org/abs/2009.00713</a> ; [2] DiffWave <a href="https://arxiv.org/abs/2009.09761">https://arxiv.org/abs/2009.09761</a> ; [3] PriorGrad <a href="https://arxiv.org/abs/2106.06406">https://arxiv.org/abs/2106.06406</a> ; [4] BDDM <a href="https://arxiv.org/abs/2203.13508">https://arxiv.org/abs/2203.13508</a> ; [5] InferGrad <a href="https://arxiv.org/abs/2202.03751">https://arxiv.org/abs/2202.03751</a> ; [6] Grad-TTS <a href="https://arxiv.org/abs/2105.06337">https://arxiv.org/abs/2105.06337</a> ; [7] SaShiMi <a href="https://arxiv.org/abs/2202.09729">https://arxiv.org/abs/2202.09729</a> ; [8] SpecGrad <a href="https://arxiv.org/abs/2203.16749">https://arxiv.org/abs/2203.16749</a> ; [9] WaveFit <a href="https://arxiv.org/abs/2210.01029">https://arxiv.org/abs/2210.01029</a> "	Junichi Yamagishi	Professor	Ph.D.	4	6 months	The successful candidate should be a PhD student in speech processing, computer science, or a related discipline. He or she should have strong programming skills. Familiarity with DNN tools (e.g., Pytorch) and speech tools is preferable. Supervision teams include Dr. Xin Wang.
K02302	Speech processing	Audio Deepfake detection combining physiological, phonetic, and explainable deep learning techniques	"Relevant but not limited to [1] <a href="https://www.asvspoof.org">https://www.asvspoof.org</a> [2] <a href="https://arxiv.org/abs/2201.03321">https://arxiv.org/abs/2201.03321</a> [3] <a href="https://www.usenix.org/system/files/sec22fall_b_lue.pdf">https://www.usenix.org/system/files/sec22fall_b_lue.pdf</a> [4] doi: 10.21437/Interspeech.2022-661 [5] Neural additive model: <a href="https://arxiv.org/abs/2004.13912">https://arxiv.org/abs/2004.13912</a> "	Junichi Yamagishi	Professor	Ph.D.	4	6 months	The successful candidate should be a PhD student in speech processing, linguistic, computer science, or a related discipline. He or she should have some programming skills. Familiarity with DNN tools (e.g., Pytorch) and speech tools is preferable. Supervision teams include Dr. Xin Wang.

No.	Research Area	Title of the Research	Website	Name of supervisor	Title of the supervisor	Requirements for Applicants: Master / Ph.D. Student	Total Number of Acceptance per Supervisor	Duration : 2-6months (less than 180days)	Comments
K02303	Speech processing	Automatic evaluation of speech and sound quality	Relevant papers include, but are not limited to: [1] Erica Cooper, Wen-Chin Huang, Tomoki Toda, Junichi Yamagishi, "Generalization Ability of MOS Prediction Networks" (ICASSP 2022) and [2] Wen-Chin Huang, Erica Cooper, Yu Tsao, Hsin-Min Wang, Tomoki Toda, Junichi Yamagishi, "The VoiceMOS Challenge 2022" (Interspeech 2022).	Junichi Yamagishi	Professor	Ph.D.	4	6 months	The successful candidate should be a PhD student in speech or music signal processing, computer science, or a related discipline. He or she should have strong programming skills and experience with speech and audio processing and/or machine learning. • Familiarity with DNN tools and speech tools are preferable. Supervision teams include Dr. Erica Cooper.
K02304	Music processing	Expressive multi-instrument musical score-to-performance generation using deep learning	Relevant papers include, but are not limited to: [1] Xuan Shi, Erica Cooper, Junichi Yamagishi, "Use of speaker recognition approaches for learning and evaluating embedding representations of musical instrument sounds," IEEE/ACM Trans. ASLP, Jan 2022, [2] Erica Cooper, Xin Wang, Junichi Yamagishi, "Text-to-Speech Synthesis Techniques for MIDI-to-Audio Synthesis," SSW 2021, and [3] Wu et al., ICLR 2022, "MIDI-DDSP: Detailed Control of Musical Performance via Hierarchical Modeling."	Junichi Yamagishi	Professor	Ph.D.	4	6 months	The successful candidate should be a PhD student in speech or music signal processing, computer science, or a related discipline. He or she should have strong programming skills and experience with speech and audio processing and/or machine learning. • Familiarity with DNN tools and speech tools are preferable. Supervision teams include Dr. Erica Cooper.
K02305	Speech processing	Controllable language-independent speaker anonymization	Relevant but not limited to [1] <a href="https://www.voiceprivacychallenge.org">https://www.voiceprivacychallenge.org</a> , [2]Miao, X., Wang, X., Cooper, E., Yamagishi, J., Tomashenko, N. (2022) Language-Independent Speaker Anonymization Approach Using Self-Supervised Pre-Trained Models. Proc. The Speaker and Language Recognition Workshop (Odyssey 2022), 279-286, doi: 10.21437/Odyssey.2022-39	Junichi Yamagishi	Professor	Ph.D.	4	6 months	The successful candidate should be a PhD student in speech processing, computer science, or a related discipline. He or she should have strong programming skills. Familiarity with DNN tools (e.g., Pytorch) and speech tools are preferable. Supervision teams include Dr. Xiaoxiao Miao.
K02306	Natural language processing	Cross-lingual few-shot learning	Relevant papers include, but are not limited to: [1] Lin et al., Few-shot Learning with Multilingual Generative Language Models, EMNLP-22.	Junichi Yamagishi	Professor	Ph.D.	4	6 months	The successful candidate should be a Ph.D. student in natural language processing, computer science/engineering, mathematics, or a related discipline and familiar with PyTorch. Supervision teams include Dr. Canasai Kruengkrai.
K02601	Multimedia Data Mining and Analysis	Multimodal deep learning and pre-training models for cross-modal retrieval between audio-video, lyrics-audio, and image-text, multimedia content recommendation	<a href="http://research.nii.ac.jp/~yiyu/">http://research.nii.ac.jp/~yiyu/</a>	Yi YU	Assistant Professor	Master/Ph.D.	4	3 - 6 months	
K02602	Artificial Intelligence and Music	Deep generative models for lyrics-to-melody generation, melody-to-lyrics generation, singing voice synthesis	<a href="https://github.com/vy1lab/Lyrics-Conditioned-Neural-Melody-Generation">https://github.com/vy1lab/Lyrics-Conditioned-Neural-Melody-Generation</a>	Yi YU	Assistant Professor	Master/Ph.D.	4	3 - 6 months	

No.	Research Area	Title of the Research	Website	Name of supervisor	Title of the supervisor	Requirements for Applicants: Master / Ph.D. Student	Total Number of Acceptance per Supervisor	Duration : 2-6months (less than 180days)	Comments
<b>4. Information and Society Research Division</b>									
J00301	Multimedia forensics	Generation and detection of fake facial videos	<a href="http://research.nii.ac.jp/~iechizen/official/research/research5-e.html">http://research.nii.ac.jp/~iechizen/official/research/research5-e.html</a>	Isao Echizen	Professor	Master/Ph.D.	5	3 - 6 months	
J00302	Multimedia security	Generation and detection of adversarial examples	<a href="http://research.nii.ac.jp/~iechizen/official/research/research5-e.html">http://research.nii.ac.jp/~iechizen/official/research/research5-e.html</a>	Isao Echizen	Professor	Master/Ph.D.	5	3 - 6 months	
J00303	Multimedia forensics	Image-based fact verification	<a href="http://research.nii.ac.jp/~iechizen/crest/en/research.html">http://research.nii.ac.jp/~iechizen/crest/en/research.html</a>	Isao Echizen	Professor	Master/Ph.D.	5	3 - 6 months	