Department of Civil and Environmental Engineering
Faculty

Position	Name		E-mail	Research Subject
Infrastructure Field				
Professor	Jun MURAKOSHI		murakos@tmu.ac.jp	Bridgel Engineering, Steel/Composite/Hybrid Structure, Fatigue, Buckling Stability, Long-Term Durability and Maintenance
Professor	Hiroyuki ONEYAMA		oneyama@tmu.ac.jp	Traffic Engineering, Transportation Planning, Transportation Environmental Analysis, Traffic Simulation, Transportation Network Analysis
Associate Professor	Tomoki ISHIKURA		iskr@tmu.ac.jp	Infrastructure Policy, National and Regional Planning, Macroeconomic Dynamics, Spatial Economics, Computable General Equilibrium Analysis
Associate Professor	Hitoshi NAKAMURA		hnaka@tmu.ac.jp	Structural Engineering, Bridge Engineering, Structural Characteristics of Cable-Supported Bridges, Application of Advanced Composite Materials for Infrastructures, Repair and Strengthening of Existing Structures
Assistant Professor	Yusuke KISHI		kishi@tmu.ac.jp	Structural Engineering, Seismic Engineering, Disaster Mitigation Engineering
Assistant Professor	Masami YANAGIHARA		yanagihara@tmu.ac.jp	Traffic Flow Analysis, Driving Behavior Modeling, Traffic Simulation, Traffic Psychology, Information Processing
Environmental System Field				
Professor	Yoshiyuki IMAMURA		imamura@tmu.ac.jp	Water Policy, Hydrology, Disaster Risk Reduction, Flood Risk Management
Professor	Katsuhide YOKOYAMA		k-yoko@tmu.ac.jp	Environmental Hydraulics, Sediment Transport and Water Environment in a Reservoir, a River, and an Estuary
Associate Professor	Yasuhiro ARAI		y-arai@tmu.ac.jp	Water Supply Engineering, Environmental Engineering, Municipal Solid Waste Management Planning, Optimization Model
Associate Professor	Hiroshi SAKAI		h_sakai@tmu.ac.jp	Water and Wastewater Engineering, Water Environment Management, Water Quality Management
Associate Professor	Tetsuya SHINTANI		shintani@tmu.ac.jp	Coastal and Ocean Engineering, Stratified Flow, Computational Fluid Dynamics
Assistant Professor	Hideo AMAGUCHI		amaguchi@tmu.ac.jp	Hydrology, River Engineering
Assistant Professor	Gubash Azhikodan		gubash@tmu.ac.jp	Hydraulic Engineering, Estuarine hydro- and morphodynamics, Cohesive sediment transport, Phytoplankton dynamics
Safety and Disaster Prevention Field				
Professor	Nobuharu ISAGO		nisago@tmu.ac.jp	Stability evaluation of ground in mountain tunneling and shield tunneling, evaluation of load- bearing capacity of support member, maintenance methodolgy, and design and operation method of attached facilities of tunnel
Professor	Yoshiya ODA		oda@tmu.ac.jp	Exploration Geophysics, Engineering Seismology, Earthquake and Volcano Disaster Prevention
Associate Professor	Kentaro OHNO		ohno@tmu.ac.jp	Concrete Engineering, Nondestructive Evaluation for Concrete Structures, Elastic wave techniques for Concrete
Associate Professor	Atsushi UENO		eagle@tmu.ac.jp	Concrete Engineering and Material Science, Environmental Consideration of Concrete and Concrete Making Materials, Evaluation of Properites of Concrete Making Materials
Associate Professor	Mitsutoshi YOSHIMINE		yoshimine-mitsutoshi@tmu.ac.jp	Soil Mechanics, Laboratory and Field Tests of Geomaterials, Soil liquefaction, Stability of Slopes and Embankments, Soil Dynamics, Transportation and Sedimentation of Debris
Assistant Professor	Kosuke KAWATA		k_kawata@tmu.ac.jp	Evaluation of deformation performance and mechanical behavior of a tunnel during external force Sophistication of tunnel design, construction and maintenance technology

(As of January 2021)

IMPORTANT LINKS :

The department of Civil and Environmental Engineering	http://www.ues.tmu.ac.jp/civil/english/index.html
Graduate School and Faculty of Urban Environmental Sciences	http://www.ues.tmu.ac.jp/en/index.html
Tokyo Metropolitan University	http://www.tmu.ac.jp/english/index.html

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences

【Name】: Nobuharu ISAGO

【Position】: Professor

【Research Topic】: Tunnel Engineering, Urban Space Engineering, Rock Mechanics

【Outline of research achievement】

The research and investigation regarding road tunnel were performed in the following theme:

1) Mechanical behavior of support structure of mountain tunnel
2) Auxiliary method of mountain tunnel
3) Characteristics of structure of shield tunnel
4) Countermeasure against earthquake of road tunnel
5) Deformation mechanism of tunnel

Various results regarding planning, design, construction and rehabilitation of tunnel were acquired.

【Presentations】

1) Analytical consideration of mechanical behavior of vertical pre-reinforcement: T.Amemiya, T.Nagata, N.Isago, K.Kawata, Proceedings of Japan Society of Civil Engineers (JSCE) No.78 Annual Meeting, 2021.9
2) Difference of main tunnel behavior by ring closure in pilot tunnel: S.Ohmori, S.Zhai, A.Devini, N.Isago, Y.Wada, K.Nakajima, Proceedings of Japan Society of Civil Engineers (JSCE) No.78 Annual Meeting, 2021.9
3) Consideration of construction joint angle of lining, J.Yagishita, S.Shibayama, K.Itagaki, I.Ohtsuka, N.Isago, Proceedings of Japan Society of Civil Engineers (JSCE) No.78 Annual Meeting, 2021.9
4) Experimental study of rational reinforcement of invert for mountain tunnel, Y.Ishii, T.Natsume, N.Isago, N.Mikami, S.Tanabe, Proceedings of Japan Society of Civil Engineers (JSCE) No.78 Annual Meeting, 2021.9
5) Necessity of reinforcement from construction data in mountain tunnel, T.Natsume, Y.Ishii, N.Isago, N.Mikami, S.Tanabe, Proceedings of Japan Society of Civil Engineers (JSCE) No.78 Annual Meeting, 2021.9
6) Experimental study of applicability and mechanical behavior of vertical pre-reinforcement, T.Nagata, T.Amemiya, N.Isago, K.Nishimura, H.Shiroma, Proceedings of Japan Society of Civil Engineers (JSCE) No.78 Annual Meeting, 2021.9
7) Experimental study of mechanical behavior during earthquake at portal of existing mountain tunnel, A.Matsuoka, Y.Yamanishi, K.Kawata, N.Isago, K.Nishimura, H,Yagi, H.Kitamura, Y.Yoshida, Proceedings of Japan Society of Civil Engineers (JSCE) No.78 Annual Meeting, 2021.9
8) Experimental study of mechanical behavior of rock bolt considering material difference, S.Morikawa, T.Matsumoto, N.Isago, S.Morimoto, D.Awaji, T.Okabe, Proceedings of Japan Society

of Civil Engineers (JSCE) No.78 Annual Meeting, 2021.9

9) Analytical study of mechanical behavior during earthquake at portal of existing mountain tunnel, Y.Yamanishi, A.Matsuoka, K.Kawata, N.Isago, K.Nishimura, H,Yagi, H.Kitamura, Y.Yoshida, Proceedings of Japan Society of Civil Engineers (JSCE) No.78 Annual Meeting, 2021.9

10) Effect on behavior of shield tunnel by joint in shield tunneling, N.Okamura, K.Kurahashi, N.Isago, M.Ishida, M.Nakajima, K.Imafuku, Proceedings of Japan Society of Civil Engineers (JSCE) No.78 Annual Meeting, 2021.9

11) Effect on ground behavior and mechanical characteristics of vertical pre-reinforcement, T.Amemiya, T.Nagata, N.Isago, Proceedings of the 34th Japan Road Conference, 2021.11

12) Mechanical behavior of tunnel portal during earthquake, A.Matsuoka, Y.Yamanishi, N.Isago, Proceedings of the 34th Japan Road Conference, 2021.11

13) Rationalization of reinforcement by invert for existing mountain tunnel, T.Natsume, Y.Ishii, N.Isago, Proceedings of the 34th Japan Road Conference, 2021.11

【Publications】

1) Mechanism of advancing drift on weak ground excavation: N. Isago, K. Shinoda, S.Ohmori, T. Okabe and A. Gomi, North American Tunneling Proceedings, 2021.6

2) Improving road tunnel resilience, considering safety and availability, PIARC Literature review : PIARC Technical Committee 4.4 (Collaborative document), 2021LR01EN, 2021

3) Analysis of ground characteristics and mechanical effect of invert at swelling rock, K.Nakano, K.Nishimura, N.Isago, Tunnels and Underground, Vol.52 No.10, pp.61-72, 2021.10

4) Consideration of the mechanical behavior of vertical pre-reinforcement, T.Amemiya, T.Nagata, N.Isago, K.Kawata, H.Shiroma, K.Nishimura, Proceedings of Tunnel Engineering, JSCE, CD-ROM, 2021.11

5) Study on seismic behavior of existing mountain tunnel portal, A.Matsuoka, Y.Yamanishi, K.Kawata, N.Isago, K.Nishimura, H.Yagi, H.Kitamura, Proceedings of Tunnel Engineering, JSCE, CD-ROM, 2021.11

6) Study on rationalization of reinforcement measures in mountain tunnels, T.Natsume, Y.Ishii, N.Isago, N.Mikami, S.Tanabe, Proceedings of Tunnel Engineering, JSCE, CD-ROM, 2021.11

7) The effect of early closure of the center drift due to differences in ground characteristics on the behavior of the main tunnel, S.Ohmori, S.Zhai, A.Devini, N.Isago, Proceedings of Tunnel Engineering, JSCE, CD-ROM, 2021.11

8) Experimental consideration of mechanical performance of rockbolt considering material difference, K.Kawata, T.Matsumoto, N.Isago, S.Morimoto, D.Awaji, T.Okabe, Proceedings of the 47th Rock mechanics symposium, JSCE, 2022.1

【External Funding Sources】

Collaborative research with 3 organization, Research Grant (Japan Tunneling Association), Specified Donation from 5 organizations

【Social Contributions (Excluding confidential activities)】

Member of Tunnel Engineering Committee, Japan Road Association

Chairman of Road Tunnel Facilities Subcommittee, Japan Road Association

Chairman of Internal Board of TC 4.4 Road tunnel operation, Japan Road Association

Member of TC 4.4 Road tunnel operation, PIARC (World Road Association)

Member of Rock Mechanics Committee, Japan Society of Civil Engineers

Member of Tunnel Engineering Committee, Japan Society of Civil Engineers

Member of International Technical Committee, Japan Tunneling Association

Chairman of ITA Subcommittee, Japan Tunneling Association

Member of Working Group 21 Life cycle asset management, International Tunneling Association

【Awards】

None

【Other Activities】

1) Britannica International Yearbook, Civil engineering tunnel, p.202, 2021.5

2) Outline of 'Road tunnel online manual' by PIARC TC 4.4, Magazine Road, No.962, pp.56-57, Japan Road Association, 2021.5

3) Mechanism of road heaving at mountain tunnel and its countermeasure, Magazine Construction Machine, No.681, Vol.57 No.11, pp.1-6, Japan Industrial Publishing, 2021.10

4) The 47th ITA General Assembly and 'Tunnel Week' Report, Tunnels and Underground (shared writing), 2021.12

5) State-of-the-art and future of tunnel maintenance, Magazine Price Data for Construction Cost Estimating, pp.56-60, Economic Research Association, 2022.2

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences

【Name】: Yoshiyuki Imamura

【Position】: Professor

【Research Topic】: River Basin Management, Disaster Risk Reduction, Water Policy

【Outline of research achievement】

I conducted research as follows:

1) Developed a flood risk index to contribute to flood risk management and policy and published the results in an international journal (Impact Factor 4.67).

2) Developing a method to evaluate the effects of 'River Basin Disaster Resilience and Sustainability by All.'

3) Improving operational efficiency of a regulating pond using deep reinforcement learning.

4) Developed a method for determining suspended matter on a river channel using AI.

5) Quantified the impact of the Great East Japan Earthquake and the effects of reconstruction projects.

6) Developing river information system analyzing river monitoring camera images using AI

【Presentations】

1) Shono Kato, Yoshiyuki Imamura, Hideo Amaguchi: Impact of the Great East Japan Earthquake and Tsunami on population by the differences in railway reconstruction patterns after, 49th Kanto Reginal Annual Meeting of Japan Society of Civil Engineering, II-37, 2022.3
2) Tapei Sato, Yoshiyuki Imamura, Hideo Amaguchi: A study on the impact of the Great East Japan Earthquake and Tsunami and the effects of reconstruction projects to coastal municipalities in Iwate Prefecture, 49th Kanto Reginal Annual Meeting of Japan Society of Civil Engineering, II-38, 2022.3
3) Ryo Murakami, Tadakatsu Takasaki, Yoshiyuki Imamura, Hideo Amaguchi, Sora Hirabayashi: Building a hydrological dataset at the time of floods in the Zenpukuji River Basin, 49th Kanto Reginal Annual Meeting of Japan Society of Civil Engineering, II-56, 2022.3
4) Yuito Aoki, Hideo Amaguchi, Yoshiyuki Imamura: A Study on formulating mountainous elements using Digital Elevation Model (DEM), 49th Kanto Reginal Annual Meeting of Japan Society of Civil Engineering, II-57, 2022.3
5) Kazushi Matsuda, Hideo Amaguchi, Yoshiyuki Imamura: Temporal changes of flood reduction function of Kamiasao Nikkodai Reservoir, 49th Kanto Reginal Annual Meeting of Japan Society of Civil Engineering, II-63, 2022.3
6) Masahiro Kawano, Yoshiyuki Imamura, Shintaro Fujitsuka, Hideo Amaguchi: Study on gate operation of a regulating pond using deep reinforcement learning, 49th Kanto Reginal Annual

Meeting of Japan Society of Civil Engineering, II-64, 2022.3

7) Sora Hirabayashi, Hiroyuki Okui, Yoshiyuki Imamura, Hideo Amaguchi, Ryo Murakami, Munenori Masuda: A study on the calculation method of the on-site hydraulic conductivity of urban green spaces using an infiltrometer, 49th Kanto Reginal Annual Meeting of Japan Society of Civil Engineering, II-65, 2022.3
8) Kento Nakajima, Hideo Amaguchi, Yoshiyuki Imamura: Study on river water level estimation method using a river monitoring camera and point cloud data in the Oguri River, 49th Kanto Reginal Annual Meeting of Japan Society of Civil Engineering, II-70, 2022.3
9) Naoki Akuta, Tadakatsu Takasaki, Yoshiyuki Imamura, Hideo Amaguchi: Study on improving efficiency in creating learning data used for a CNN model to identify the floating substances, 49th Kanto Reginal Annual Meeting of Japan Society of Civil Engineering, II-71, 2022.3

【Publications】

1) Yoshiyuki Imamura: Development of a Method for Assessing Country-Based Flood Risk at the Global Scale, International Journal of Disaster Risk Science, 2022 13, pp.87-99, 2022.2
2) Yoshiyuki Imamura: Development of the United Nations World Water Assessment Programme and UN World Water Development Report 2020 (Water and Climate Change), Journal of Hydrological System, Association for Rainwater Storage and Infiltration Technology, 2021 Vol.122, pp.45- 50, 2021.9
3) Yoshiyuki Imamura: Integration of water management, Chapter 11, Section 2, Second edition of the Hydrological and Water Resources Handbook, Japan Society of Hydrology and Water Resources (Scheduled to be published in FY2022).

【External Funding Sources】

1) Representative, Research and development on AR (Augmented Reality) technology using river monitoring cameras, Research representative, Kanto Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism, FY2021-2023

【Social Contributions (Excluding confidential activities)】

1) Visiting Professor, Yamaguchi University
2) Member of the International Committee of the Japan Society for Natural Disaster Science
3) Member of the Center for Research and Application of Satellite Remote Sensing

【Awards】

1) Sora Hirabayashi, Hiroyuki Okui, Yoshiyuki Imamura, Hideo Amaguchi, Ryo Murakami, Munenori Masuda: A study on the calculation method of the on-site hydraulic conductivity of urban green spaces using an infiltrometer, Excellent Presenter Award, 49th Kanto Reginal Annual Meeting of Japan Society of Civil Engineering, II-65, 2022.3

2) Kazushi Matsuda, Hideo Amaguchi, Yoshiyuki Imamura: Temporal changes of flood reduction function of Kamiasao Nikkodai Reservoir, President's Award, Alumni Association of the Civil and Environmental Department of Tokyo Metropolitan University.

【Other Activities】

1) Special lecture "Climate change and flood risk management " (Lecturer: Mr. Tomoo Inoue, General Director of Water and Disaster Management Bureau, Ministry of Land, Infrastructure, Transport and Tourism), 2022.1

2) Joint research with Tokyo Metropolitan Government: Yoshiyuki Imamura, Hideo Amaguchi, Shigeyuki Ishihara: Research on river basin management ① Building a high resolution rainfall runoff model, ② Developing an evaluation method of effectiveness of rainwater runoff control facilities, ③ Developing automatic creation method of feature data, ④Application of image processing technology to water environment monitoring.

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences
【Name】: Yoshiya ODA
【Position】: Professor
【Research Topic】: Exploration Geophysics
【Outline of research achievement】
We, Exploration Geophysics Laboratory, focus on development of new analysis methods for exploration geophysics and its applications to civil engineering, earthquake engineering and volcanic engineering fields. The main research topics of this year are as follows: 1) Dense seismic observation in Hachijojima Island, Tokyo. 2) Crustal structure (velocity/attenuation) and surface displacement using InSAR analysis of Kozushima Island, Tokyo. 3) Seismic phase detection using deep learning technology. 4) Estimation of crack depth using surface wave for concrete structures.

【Presentations】
1) Yusei Hamamura, Hiroyuki Azuma, Yoshiya Oda, Surface displacement in Hachijojima Island since 2014 by InSAR analysis and GNSS, JpGU Meeting 2021, STT36-P02. (2021. 6)
2) Utako Watanabe, Hiroyuki Azuma, Yoshiya Oda, Attenuation characteristics of Hachijojima Island from twofold spectral ratio method using dense seismic observation, JpGU Meeting 2021, SVC28-09. (2021. 6)
3) Hikaru Kunimasa, Hiroyuki Azuma, Yoshiya Oda, Automatic Detection of First Arrival Time of Seismic Waves with the Fine-tuning: Applying to Observed Datas in Hachijojima, JpGU Meeting 2021, SVC28-10. (2021. 6)
4) Shotaro Kanke, Hiroyuki Azuma, Yoshiya Oda, Three-Dimensional Crustal Structure beneath Hachijojima Island using dense seismic observation data, JpGU Meeting 2021, SVC28-P10. (2021. 6)
5) Tsutomu Ochiai, Takahisa Enomoto, Yoshiya Oda, Kazuya Mitsuji, Shigeki Senna, Relationship between soil characteristics estimated from microtremors and house damage during the 1894 Shonai Earthquake, Proceedings of the 76th Annual Conference of the Japan Society of Civil Engineers, CS10-43. (2021. 9) [in Japanese]
6) Yoshiya Oda, Nanako Yokota, and Hiroyuki Azuma, Surface displacement based on InSAR analysis and seismic damage associated with the 2016 Kumamoto earthquake, The 14th SEGJ International Symposium. (2021. 10)
7) Hikaru Kunimasa, Hiroyuki Azuma, and Yoshiya Oda, Automatic detection of first arrival time of seismic waves with the fine-tuning: Applying to observed data in Hachijojima, The 14th SEGJ International Symposium. (2021. 10)
8) Utako Watanabe, Hiroyuki Azuma, and Yoshiya Oda, Attenuation characteristics of Hachijojima

volcano from twofold spectral ratio method using dense seismic observation, The 14th SEGJ International Symposium. (2021. 10)

9) Shotaro Kanke, Hiroyuki Azuma, and Yoshiya Oda, High-resolution velocity image beneath Hachijojima Island from dense seismic observation data, The 14th SEGJ International Symposium. (2021. 10)

10) Tsutomu Ochiai, Takahisa Enomoto, Yoshiya Oda, Michio Miyano, Eiske Ikuta, and Manuel Navarro, Comparison of house damage and microtremor results in past earthquakes, The 14th SEGJ International Symposium. (2021. 10)

11) Yoshiki Minami, Hiroyuki Azuma, Yoshiya Oda, Toru Takahashi, Kyosuke Onishi, Shinichiro Iso, Estimation of crack depth in concrete using attenuation effect of surface wave, The 145th SEGJ Conference. (2021. 11)

12) Hikaru Kunimasa, Ryohei Tottori, Hiroyuki Azuma, Yoshiya Oda, Automatic detection of first arrival time of seismic waves with deep learning using Transformer; Applying to observation data in Hachijojima, The 145th SEGJ Conference. (2021. 11)

13) Utako Watanabe, Hiroyuki Azuma, Yoshiya Oda, Toshiki Watanabe, Application of seismic interferometry to dense seismic observation data in Hachijojima Island, The 145th SEGJ Conference. (2021. 11)

14) Ryohei Tottori, Hiroyuki Azuma, Yoshiya Oda, Toshifumi Matsuoka, Nobuhiro Eki, Yuji Kawamoto, An attempt to detect events by deep learning on 3D data, part 2, The 145th SEGJ Conference. (2021. 11)

【Publications】

1) Yoshiya Oda, Nanako Yokota, and Hiroyuki Azuma, Surface displacement based on InSAR analysis and seismic damage associated with the 2016 Kumamoto earthquake, Proceedings of the 14th SEGJ International Symposium, 315-318, 2021.10, https://doi.org/10.1190/segj2021-083.1

2) Hikaru Kunimasa, Hiroyuki Azuma, and Yoshiya Oda, Automatic detection of first arrival time of seismic waves with the fine-tuning: Applying to observed data in Hachijojima, Proceedings of the 14th SEGJ International Symposium, 116-119, 2021.10, https://doi.org/10.1190/segj2021-032.1

3) Utako Watanabe, Hiroyuki Azuma, and Yoshiya Oda, Attenuation characteristics of Hachijojima volcano from twofold spectral ratio method using dense seismic observation, Proceedings of the 14th SEGJ International Symposium, 283-286, 2021.10, https://doi.org/10.1190/segj2021-075.1

4) Shotaro Kanke, Hiroyuki Azuma, and Yoshiya Oda, High-resolution velocity image beneath Hachijojima Island from dense seismic observation data, Proceedings of the 14th SEGJ International Symposium, 299-302, 2021.10, https://doi.org/10.1190/segj2021-079.1

5) Tsutomu Ochiai, Takahisa Enomoto, Yoshiya Oda, Michio Miyano, Eiske Ikuta, and Manuel Navarro, Comparison of house damage and microtremor results in past earthquakes, Proceedings of the 14th SEGJ International Symposium, 291-294, 2021.10, https://doi.org/10.1190/segj2021-077.1

【External Funding Sources】

1) Grant-in-Aid for Scientific Research(C): Co-Investigator, 2019-2021
2) Grant-in-Aid for Scientific Research(C): Co-Investigator, 2020-2022
3) Specified Donations

【Social Contributions (Excluding confidential activities)】

1) Board member: The Society of Exploration Geophysicist of Japan (Chair: Committee of international affairs)
2) Member: Committee on education of universities and graduate schools, Japan Society of Civil Engineering

【Awards】

The 14th SEGJ International Symposium Outstanding Student Presentation Award (MS student)

【Other Activities】

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences
【Name】: Hiroyuki Oneyama
【Position】: Professor
【Research Topic】: Traffic and Transportation Engineering
【Outline of research achievement】

1) Regarding the moving light guide system as a measure against traffic congestion on the expressway, the effect of increasing the flow rate was clarified by the following behavior analysis and simulation analysis in the non-congested flow under the mixture of automated and human driving vehicles. In addition, the effect was clarified by a driving simulator experiment in a congested flow.
2) We constructed a resting place selection model for the driver, verified its validity, and proposed a resting function evaluation method for roadside stations. We also focused on the function of the transportation hub at the roadside station and proposed an evaluation method from the viewpoint of facilities and location.
3) As a study of performance evaluation of signalized intersections, we analyzed factors of fluctuations in saturation flow rates, examined methods for setting saturation traffic flow rates based on observations, and analyzed the effects of lamp positions on complex intersection shapes.

【Presentations】

1) Analysis of the Relationship between Driving Intention and Driving Behavior during Lane Change Considering Stress, Proceedings of Infrastructure Planning (JSCE), Vol.64, 2021.11 [in Japanese].
2) Proposal of Convenience and Capacity Evaluation Method for Roadside Station Facilities as a Transportation Hub, Proceedings of Infrastructure Planning (JSCE), Vol.64, 2021.11 [in Japanese].
3) Evaluation of Rest Facility Function by Rest Facility Selection Behavior Model Based on the Utility of Ordinally Road Users, Proceedings of Infrastructure Planning (JSCE), Vol.64, 2021.11 [in Japanese].
4) Vehicle Behavior Analysis for Different Signal Lamp Positions Focusing on Intersection Geometry, Proceedings of Infrastructure Planning (JSCE), Vol.64, 2021.11 [in Japanese].
5) Estimation Method of Saturation Flow Rate for Shared Left-Turn Lane Using Probability Distribution of Average Headway, Proceedings of Infrastructure Planning (JSCE), Vol.64, 2021.11 [in Japanese].
6) Quantitative Evaluation of Level of Service for Various Terminal Modes, Proceedings of Infrastructure Planning (JSCE), Vol.64, 2021.11 [in Japanese].

7) Comparison Verification of Saturation Flow Rate Setting Methods by Observing for Shared Left-Turn Lane at Signalized Intersection, Proceedings of Annual Conference of JSCE, No.76, IV-139, 2021.9 [in Japanese].
8) Comparative Analysis of Vehicle Behavior for Different Signal Lamp Positions at Complex Intersection, Proceedings of Annual Conference of JSCE, No.76, IV-138, 2021.9 [in Japanese].
9) Proposal of a Method for Evaluating the Utilization potential of Michi-no-Eki as a Transportation Hub, Proceedings of Annual Conference of JSCE, No.76, IV-49, 2021.9 [in Japanese].
10) Effect of Motorcycle Composition on Traffic Accident Rate in Mixed Traffic Composition, The 14th Intl. Conf. of Eastern Asia Society for Transportation Studies (EASTS), 2021. Sep.
11) Resting Place Selection Model for Travels along Ordinary Roads, The 14th Intl. Conf. of Eastern Asia Society for Transportation Studies (EASTS), 2021. Sep.
12) Analysis of Resting Place Selection Behavior Along Ordinary Roads Based on Web Questionnaire, The 14th Intl. Conf. of Eastern Asia Society for Transportation Studies (EASTS), 2021. Sep.
13) Accessibility Evaluation Considering Consumed Calories - Case study in the Tokyo Coastal Sub-center Area -, The 14th Intl. Conf. of Eastern Asia Society for Transportation Studies (EASTS), 2021. Sep.
14) Comparative Analysis of Vehicle Behavior for Different Signal Lamp Positions at Complex Intersection, Annual Meeting of Japan Society of Traffic Engineers, Vol.41, 2021.8 [in Japanese].
15) Comparison Verification of Saturation Flow Rate Setting Methods by Observing for Shared Left-turn at Signalized Intersection, Annual Meeting of Japan Society of Traffic Engineers, Vol.41, 2021.8 [in Japanese].
16) Fluctuation Analysis of Saturation Flow Rate with Traffic Detector Data, Annual Meeting of Japan Society of Traffic Engineers, Vol.41, 2021.8 [in Japanese].

【Publications】

1) Jae-Seop Yang, et. al. (total 12 authors) : Tokyo seen from Seoul, Seoul seen from Tokyo Comparison of Urban Spatial Policies in Seoul and Tokyo in the 2000s, published by Seoul Institute, 2022, Jan., ISBN : 9791157006427 , (Oneyama wrote Sec. 10-2) [in Korean].
2) H.Oneyama, M.Yanagihara and Y.Kawabe: Accessibility Evaluation Considering Consumed Calories - Case study in the Tokyo Coastal Sub-center Area -, Proc. of Eastern Asia Society for Transportation Studies, online, No.77, 2021, Dec.
3) R.A.Junirman and H.Oneyama: Effect of Motorcycle Composition on Traffic Accident Rate in Mixed Traffic Composition, Proc. of Eastern Asia Society for Transportation Studies, online, No.121, 2021, Dec.
4) H.Oneyama : Current Status and Problems of Road Traffic Noise and Air Pollution, Transport Policy in Perspective 2021, pp.76-77, 2021, Mar.
5) H.Terada, M.Yanagihara and H.Oneyama: Influence of Moving Light Guide System on Traffic Flow in Presence of Autonomous Vehicles. Int. Journal of ITS Research Vol.19, pp.335-346,

issued 2021 Feb, published 2021 June.

【External Funding Sources】

・Grant-in-Aid for Scientific Research (C) Applicability of moving light guide system to traffic control in the presence of autonomous vehicles (Principal Investigator, 2019-2021)

・Grant-in-Aid for Scientific Research (B) Results and formation process of neoliberal city planning system in East Asian megacities (Co-Investigator, Principal Investigator：Shin Aiba, 2018-2020, extended until 2022)

【Social Contributions (Excluding confidential activities)】

- Japan Society of Traffic Engineers：Vice Chairperson, research committee and Chairperson, research planning subcommittee, Member, General Affairs Committee, Member, Qualification committee, Lecturer, intersection design training seminar and Member, First academic subcommittee.
- Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism：Member, Regional Economic Strategy Study Group and Member, Committee on Advanced Road Technology.
- College of Land, Infrastructure, Transport and Tourism, Ministry of Land, Infrastructure, Transport and Tourism: Lecturer.
- Tokyo National Highway Office, Kanto Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism：Member, Study Committee on the Bicycle Traffic Space Improvement Plan.
- Express Highway Research Foundations of Japan：Member, Editorial committee and Chairperson, Paper Award Selection Committee.
- Sagamihara City, Kanagawa：Member, Environmental Impact Assessment Committee
- Hino City, Tokyo：Chairperson, Universal Design Association and Sub Chairperson , Regional Public Transportation Conference
- Akiruno City, Tokyo：Chairperson, Public Transportation Examination Conference
- NEXCO Research Institute Limited : Chairperson, Study Committee on the interior board in tunnel
- East Nippon Expressway Co. Ltd. : Member, Kanto branch office traffic control measures committee
- Central Nippon Expressway Co. Ltd.：Chairperson, Study Committee on provision methodology of road information in the Greater Tokyo Area and Member, Committee on Traffic Measures for Road Closure due to Renewal Road Works along Tomei Expressway Fuji IC-Shimizu JCT.
- Metropolitan Expressway Co. Ltd.：Chairperson, Study Meeting on traffic safety measures in the Metropolitan Expressway, Member, Study Meeting on traffic flow estimation, Member, Committee on Disaster Prevention and Safety Measures in Tunnels on the Metropolitan Expressway, Member, Committee on Disaster Prevention and Safety Measures in the Nihonbashi section underground project and Member, Technical Committee on Large-scale Renewal, Repair and Functional Enhancement of the Metropolitan Expressway
- Urban Renaissance Agency：Chairperson, Research WG on Traffic management under

Construction in Complex and Large Scale Urban Renewal.

- PIARC, World Road Association : Member, Technical Committee(TC)3.1

【Awards】

-None

【Other Activities】

-None

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Environmental Engineering
【Name】: Jun MURAKOSHI
【Position】: Professor
【Research Topic】: Bridge Engineering, Steel Bridge Design, Remaining Load-carrying Capacity Evaluation and Fatigue Evaluation of Steel Highway Bridge, Repair and Strengthening

【Outline of research achievement】

1) Research on performance evaluation of SFRC overlays as a measure to improve durability of existing orthotropic steel decks

Murakoshi, J.

With rapid increase of truck weight and traffic volume in Japan, various types of fatigue cracks have recently been observed in existing orthotropic steel decks (OSDs) under severe traffic condition. As an effective retrofit measure to prevent those cracks, steel fiber reinforced concrete (SFRC) overlays have been increasingly used for damaged OSDs. On the other hand, there are no sufficient data to ensure its durability. It is important to investigate the durability performance under the effect of repeated wheel load and environmental action. The purpose of the research is to clarify durability of adhesively bonded joints between SFRC and deck plate, and to propose testing procedures for evaluating the durability.

In this fiscal year, using small test specimens simulating the adhesive joints between SFRC overlay and deck plate, core extraction tests were conducted with parameters of core size and deck thickness, and the test conditions/the technical focal points during field tests were clarified.

2) Research on fatigue durability evaluation and diagnosis of existing steel I-girder highway bridges

Murakoshi, J. and Kishi, Y.

Serious fatigue damage which may lead to fracture of main girder have been observed on existing old welded girder bridges under severe traffic condition. To assure structural safety of huge number of aging bridges, it is important to manage those bridges efficiently by using information about fatigue vulnerability in addition to periodic inspection. The purpose of the research is to assess fatigue vulnerability and to propose practical diagnosis method for existing steel I-girder bridges constructed in 1960's and 1970's, when fatigue design was not performed.

In this fiscal year, based on the FEM data sets of old steel I-girders with various structural dimensions, a simple/practical method to estimate live load stress of main girders for fatigue design by using load distribution factor were proposed by regression analyses. Also, local stress behaviors were analytically investigated focusing on fatigue cracks at main girder-cross beam connection in steel I-girder bridges.

3) Research on evaluation method of remaining load carrying capacity for existing structural members in steel and composite structures

Murakoshi, J., Kishi, Y. and Nogami, K.

In Japan, majority of highway bridges was constructed during the high economic growth period and the number of bridges over 50 years is increasing drastically. With increase of aging bridges, deteriorated bridges are likely to increase rapidly under heavy traffic condition and severe environment unless proper maintenance is conducted. Corrosion is a major damage for steel bridges, especially at girder ends, and sectional loss of structural members can result in decrease of the load carrying capacity. With regards to steel truss bridges, severe corrosion with sectional loss around gusset connections often have possibility to lead to fatal accident. However, in the both cases, since corrosion appears in various forms, effective/practical techniques to estimate the ultimate strength of the corroded members are under development. This research focuses on proposing a practical approach for evaluating remaining capacity of bridge systems with severe corroded members.

In this fiscal year, static loading test for a corroded riveted girder end specimen was conducted under lateral load in order to evaluate the influence of section loss on the ultimate behavior/load bearing capacity. Also, finite element analyses were done for a welded I-girder bridge in order to clarify the damage process and the effect of additional reinforcing ribs under seismic lateral load.

【Presentations】

1) Ishikawa, R., Murakoshi, J. and Kishi, Y.: Study on the load distribution factor for fatigue evaluation of steel girder bridges, 10th International Conference of Bridge Maintenance, Safety and Management (IABMAS2020), Sapporo, Japan (Online Symposium), 2021.4.
2) Katayama, T., Murakoshi, J., Nogami, K. and Kishi, Y.: Load-carrying capacity and damage mechanism at girder end of steel girder bridge under seismic lateral force, Proceedings of 11th International Symposium on Steel Structures, Jeju, Korea (Online Symposium), 2021.11.
3) Wei, Z., Murakoshi, J., Ono, S., Sasaki, R. and Takahashi, M.: (61) Aging properties of adhesive joint in SFRC overlay test specimen stored during about 13 years, Proceedings of 14th Symposium on application of hybrid/composite structures, pp.61-1-61-6, 2021.11. (in Japanese)
4) Shishido, K., Murakoshi, J., Ono, S., Sasaki, R. and Chiba, H.: (7) Effects of test conditions on tensile strength characteristics of adhesively bonded joint in SFRC overlay, Proceedings of 14th Symposium on application of hybrid/composite structures, pp.7-1-7-8, 2021.11. (in Japanese)

【Publications】

1) Huang, Z., Murakoshi, J., Nogami, K. and Kishi, Y.: Simple calculation method of remaining capacity of compressive members with uniform local corrosion in steel truss bridge, Journal of Structural Engineering, JSCE, Vol.68A, pp.11-24, 2022.3. (in Japanese)
2) Yamamoto, K., Murakoshi, J. and Josen, Y.: Investigation of fatigue damage cases at main girder-cross member connection in steel I-girder bridge based on inspection data, JSSC, Steel Construction Engineering Journal, Vol.28, No.112, pp.89-100, 2021.12. (in Japanese)
3) Wei, Z., Murakoshi, J., Shishido, K., Horii, H. and Ono, S: Accelerated aging test of epoxy resin adhesives for bonding of SFRC overlay in orthotropic steel deck, Proceedings of Constructional Steel, JSSC, Vol.29, pp.117-127, 2021.11. (in Japanese)

4) Wada, S., Muraksohi, J., Nogami, K. and Kishi, Y.: Numerical study on the behavior of corroded steel riveted girder bridge under lateral load, Proceedings of Constructional Steel, JSSC, Vol.29, pp.33-57, 2021.11. (in Japanese)

【External Funding Sources】

・Practical diagnostic method for fatigue damages at main girder-cross beam connection in steel highway bridge, Principal Investigator, JSPS KAKENHI Grant No.21K04237, FY2021-FY2023
・Study on evaluation of remaining load carrying capacity of steel girder ends III, Principal Investigator, Research funds of JISF, FY2021
・Study on effective countermeasures for fatigue cracks at main girder-cross member connection in steel girder bridges, Principal Investigator, Specific Research Donations of Highway Technology Research Center, FY2021-FY2022

【Social Contributions (Excluding confidential activities)】

・Japan Road Association, Member of Committee on Bridges
・JSCE, Member of Committee on Steel Structure, Chairman of Sub-committee for Standard Specifications for Steel and Composite Structures
・College of Land, Infrastructure, Transport and Tourism, MLIT, Lecturer of Training Course on Design and Maintenance of Highway Structures
・Ehime University, Lecturer of Maintenance Experts Training Course
・Tokyo Metropolitan Public Corporation by Road Improvement and Management, Lecturer of Bridge Maintenance Professional Engineering Training Course

【Awards】

・JSCE Awards (Paper Awards), 2021.6.
・Leading Professor 2021, The Faculty of Urban Environmental Sciences, TMU

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences
【Name】: Yasuhiro Arai
【Position】: Associate Professor
【Research Topic】: Water Supply Engineering, Environmental Systems
【Outline of research achievement】
1) Regarding water supply engineering, research on updating and maintenance of water pipe networks and research on water leakage detection using IoT and AI were carried out.
2) Regarding waste treatment, research was conducted on the stable operation of incineration facilities and the effective use of incineration residues in response to changes in waste composition.
【Presentations】
1) Yasuhiro ARAI, Kaito OKI, Takaharu KUNIZANE, Akira KOIZUMI, Kazuhisa FUJIKAWA, Souichiro SAKAI and Keita SASAKI (2021) Logistic regression analysis with the high and low values of the basic unit water volume of domestic water as the objective variables, Proceedings of Reiwa 3rd Annual Meeting of the Japan Society of Civil Engineers, Ⅶ-37. (in Japanese)
2) Yasuhiro ARAI (2021) Water Quality Simulation and Residual Chlorine Control in water distribution pipes, Proceedings of the 24th Symposium of Japan Society on Water Environment (JSWE) , pp.122-123. (in Japanese)
3) Yasuhiro ARAI, Yusuke NAKAOKA, Takaharu KUNIZANE and Akira KOIZUMI (2021) Prediction of residual chlorine concentration in water distribution system by LSTM: Effect of differences in validation data length / training data start date on machine learning models, Proceedings of the 49th Annual Meeting on the Environmental Systems Research, p.214. (in Japanese)
4) Yasuhiro ARAI, Akira KOIZUMI, Takaharu KUNIZANE, Hiroshi SAKAI, Kazuhisa FUJIKAWA, Souichiro SAKAI and Keita SASAKI (2021) Estimated model of water unit consumption by purpose of use that reflects the actual state of water usage: Consideration of increase in water consumption due to aging society and promotion of telework, Proceedings of Reiwa 3rd JWWA Annual Conference and Symposium, pp. 70-71. (in Japanese)
【Publications】
1) Youngwook Nam, Yasuhiro Arai, Takaharu Kunizane and Akira Koizumi (2021) Water leak detection based on convolutional neural network using actual leak sounds and the hold-out method, Water Supply, Volume21, Issue7:3477-3485.
2) Kaito OKI, Yu TAKAHASHI, Yasuhiro ARAI, Takaharu KUNIZANE, Akira KOIZUMI, Kazuhisa FUJIKAWA, Souichiro SAKAI and Keita SASAKI (2021) Analysis of questionnaire survey data to understand the impact factors on the amount of water used for domestic water: Logistic regerssion analysis for binary variables categorized by the amount of water consumption, Journal of JSCE,

Ser.G, Vol.77, No.6 (Environmental Systems Research Vol.49), pp.Ⅱ-43-Ⅱ-52. [in Japanese]
3) Ryota SUZUKI, Takaharu KUNIZANE, Yasuhiro ARAI, Akira KOIZUMI, Kazuhisa FUJIKAWA, Eiji OMORI, Masanobu SEKITA, Takuya TANAKA, Naotaka OTSUKI, Katsuya USUKI and Chihiro FUKUOKA (2021) Analysis of change over time in pitting corrosion depth of cast iron pipes using pipe survey data, Journal of JSCE, Ser.G, Vol.77, No.7, pp.Ⅲ-33-Ⅲ-40. [in Japanese]
4) Takaharu KUNIZANE, Akira KOIZUMI, Yasuhiro ARAI, Ryunosuke HIRAMATSU, Kazuhisa FUJIKAWA, Eiji OMORI and Masanobu SEKITA (2021) Comparative analysis of rehabilitation plan scenarios for water distribution mains considering long-term fluctuations in water demand, Journal of JSCE, Ser.G, Vol.77, No.7, pp.Ⅲ-41-Ⅲ-49. [in Japanese]
5) Shingo Adachi, Yasuhiro Arai, Akira Koizumi, Kenji Koizumi, Shinsuke Takahashi and Hiroto Yokoi (2021) A Parameter Determination Method Aiming to Reproduce Operation Records for an Optimal Operation Model of a Water Supply System with Service Reservoirs, IEEJ Transactions on Electronics Information and Systems, Vol.172, No.1, pp.64-73.[in Japanese]

【External Funding Sources】

1) Grant-in-Aid for Scientific Research [KAKENHI] (C), 20K12277, Co-Investigator, 2020-2022.
2) Japan Water Research Center, NewPipes Project (2020-2022).

【Social Contributions (Excluding confidential activities)】

1) Tokyo Metropolitan Government / Council for Environmental Impact Assessment
2) Sagamihara City / Council for Small Water Supply System
3) Akishima City / Committee for Public Facilities Comprehensive Management Plan Promotion

【Awards】

None

【Other Activities】

Collaborative research with Bureau of Waterworks Tokyo Metropolitan Government (TMWB)
1) Study on the actual usage of domestic water focusing on changes in population structure and lifestyle. (2020-2022)
2) Joint research on water distribution network pipeline renewal plan based on service life. (2020-2022)

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences
【Name】: Tomoki Ishikura
【Position】: Associate Professor
【Research Topic】: Infrastructure Planning and Management
【Outline of research achievement】
1) The new high speed rail Chuo Shinkansen using SuperConducting MAGnetic LEVitation, SCMAGLEV, railway system will drastically change the intercity mobility. The revolution of the mobility can influence to economic and geographic status of Japan. This paper develops a spatial economic model based on quantitative spatial economics (QSE) framework and estimates the impacts caused by Chuo Shinkansen by using the model. According to the short run analysis results, the almost all regions gain the welfare improvement. However, our estimation implies the demographic agglomeration into a small number of regions will arise in long run.

2) We introduce `interregional commodity flow model (ICFM)' developed by Kim, Ham and Boyce (PiRS2002). ICFM is an integrated system of transport network and input-output modeling, which describes the interaction of transport network flows and commodity trade demand and estimates regional and inter-regional commodity flows and transport network flows simultaneously. The model furthermore estimates the changes in shortest path and minimum generalized cost of each region-pair. We apply the model to Japanese inter-prefecture transport network for the estimation of impacts by volcanic ash fall. The application study estimates the impacts of two eruption scenarios, Mt.Fuji and Mt.Asama. Assuming that capacity of transport link including the road sections where the volcanic ash falls decreases, we estimate the influences on transport network flows and commodity flows. The results show remarkable changes in shortest route of specific O-D pairs and generation of new bottlenecks caused by traffic concentration. Thus, the study can contribute to the discussion of vulnerable network and regions when volcanic eruption takes place.

【Presentations】
1) Ishikura, Tomoki, Economic and geographical impacts of the new high speed rail Chuo-Shinkansen SCMAGLEV", Proceedings of Infrastructure Planning 63, CD-ROM, June 2021, Online.
2) Ueki, Ryo. and Ishikura, Tomoki., An analysis on the branding factors of the clubs belong to Japan Professional Football League focusing on the revenue, Proceedings of Infrastructure Planning 64, CD-ROM, November 2021, Online.
3) Yamamot, Kazuki. and Ishikura, Tomoki., Estimating trade barriers between domestic regions

using gravity model based on trade theory, Proceedings of Infrastructure Planning 64, CD-ROM, November 2021, Online.

4) Iso, Shogo. and Ishikura, Tomoki., Impact assessment of volcanic ash fall on road traffic and sectoral freight flow in a municipal network, Proceedings of Infrastructure Planning 64, CD-ROM, November 2021, Online.
5) Iso, S. and Ishikura, T.: Impacts assessment on the road transport network and freight flow caused by volcanic ash fall in Japan, 60th Congress of the European Regional Science, August 2021. Online

【Publications】

1) Ishikura, Tomoki. and Yamamoto, Kazuki., An application of a trade barrier estimation method based on the theoretical foundation of multi-regional trade model for Japanese inter-regional trade, Journal of Japan Society of Civil Engineers, Ser. D3 (Infrastructure Planning and Management), forthcoming.

【External Funding Sources】

JSPS　KAKENHI, Grant-in-Aid for Scientific Research (B), 19H02264, Principal Investigator, 2019-2021.
JSPS　KAKENHI, Grant-in-Aid for Scientific Research (B), 19H02262, Co-Investigator, 2019-2021.

【Social Contributions (Excluding confidential activities)】

NA

【Awards】

NA

【Other Activities】

NA

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences

【Name】: Atsushi Ueno

【Position】: Associate Professor

【Research Topic】: Materials for Civil engineering, Concrete engineering

【Outline of research achievement】

1) A study on durability and skid resistance of concrete pavement, detail investigation of surface texture factors of concrete pavement to maintain high skid resistance were conducted from the stand point of a traffic safety. Influence of steam curing condition on properties of hardened concrete for durable pre-cast concrete products, evaluation of properties of volcanic materials as concrete making materials, were examined as the basic properties for various types of concrete.

【Presentations】

1) Study on Setting behavior and resistance to freezing and thawing action of Ultra Low water cement ratio concrete, The 76th Annual Meeting Proceedings, Sep. 2021

2) Other 4 presentations on concrete technology.

【Publications】

1) Behavior of High-Nickel Type Weathering Steel Bars in Simulated Pore Solution and Mortar under Chloride-Containing Environment, Emel Ken D. Benito (UPLB), Atsushi Ueno and Tomoko Fukuyama (Ritsumeikan Univ.), Journal of Advanced Concrete Technology Vol. 19, 370-381, May 2021

2) Other 12 technical papers or books.

【External Funding Sources】

1) NEDO Green innovation funds.

2) Grants-in-Aid for Scientific Research (C)

3) One funding support for basic study on acceleration curing of precast concrete.

【Social Contributions (Excluding confidential activities)】

1) 6 technical committees on JSCE

2) 4 technical committees on JCI (Japan Concrete Institute)

3) 1 technical committees on JCA (Japan Cement Association)

4) 1 technical committee on JSPS (Japan Society for the Promotion of Science)

【Awards】

1) 1 paper award in Japan Concrete Institute Annual Conference.

【Other Activities】

1) Co-operation with Tokyo Metropolitan Gov.

2) Research work in Research center for volcanic hazards and their mitigation of TMU.

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences

【Name】: Kentaro OHNO

【Position】: Associate Professor

【Research Topic】: Concrete Structure, Maintenance and Non-destructive Testing for Existing Concrete Structures

【Outline of research achievement】

1) Estimation of concrete stress in prestressed concrete by using ultrasonic
2) Estimation of strength in early age concrete for lining concrete by impact elastic wave method
3) Effect of both crack width and leakage of concrete on ultrasonic propagation characteristics
4) Investigation of AE source location method with P-wave velocity change
5) Process monitoring of steam-cured concrete by ultrasonic and AE methods

【Presentations】

1) Sochi SAKAI, Atsushi UENO, Kimitaka UJI and Kentaro OHNO : Effect of entrained air on mortar after steam curing, Proceedings of the 76th Annual Conference of the Japan Society of Civil Engineers, V-216, 2021. Sep.[in Japanese]
2) Ryutaro KASASHIMA, Kentaro OHNO, Kimitaka UJI and Atsushi UENO : Detection of horizontal cracks in RC slabs with asphalt pavement by using deflection resonance due to steel ball impact, Proceedings of the 76th Annual Conference of the Japan Society of Civil Engineers, V-318, 2021. Sep.[in Japanese]
3) Satoshi IWANO, Shinya UCHIDA, Masakazu HARUHATA, Kentaro OHNO and Shigeto KATAOKA : Comparison of elastic waves propagating in embedded steel under different adhesion conditions with concrete, Proceedings of the 76th Annual Conference of the Japan Society of Civil Engineers, V-319, 2021. Sep.[in Japanese]
4) Emi OSANO, Kentaro OHNO, Kimitaka UJI and Atsushi UENO : Estimation crack depth in concrete by impact elastic wave method, Proceedings of the 76th Annual Conference of the Japan Society of Civil Engineers, V-320, 2021. Sep.[in Japanese]
5) Ko HIWATASHI, Kentaro OHNO, Atsushi UENO, Kimitaka UJI, Noriyuki UTAGAWA, Shinya KITAGAWA and Junichi HAYAKAWA : Relation between compressive strength of early age concrete and elastic wave propagation characteristics in steel-concrete bonding, Proceedings of the 76th Annual Conference of the Japan Society of Civil Engineers, V-332, 2021. Sep.[in Japanese]
6) Shunsuke IZUMI, Atsushi UENO, Kentaro OHNO and Kimitaka UJI : Applicability of water absorption measuring by electronic resistance method for fine aggregate from volcanic sedimentation and mechanical properties of mortar, Proceedings of the 76th Annual Conference

of the Japan Society of Civil Engineers, V-476, 2021. Sep.[in Japanese]

7) Masato ASAKURA, Koji YAMAMOTO, Kentaro OHNO and Atsushi UENO：Investigation on AE generation behavior in concrete with heterogeneous distribution of coarse aggregate particles under uniaxial compression loading, Proceedings of 2021 National Conference on Acoustic Emission, pp.63-66, 2021.Nov. [in Japanese]

【Publications】

1) Motoki ABE, Atsushi UENO, Kimitaka UJI and Kentaro OHNO：Basic Study on Dispersibility Design in Medium Phase based on the Properties of Polypropylene Fiber, Proceedings of the Japan Concrete Institute, Vol.43, No.1, pp.293-298, 2021.6 [in Japanese]
2) Satoshi SAITO, Kimitaka UJI, Atsushi UENO and Kentaro OHNO：Evaluation of quality variations of concrete with different viscosities when passing through rebar gaps, Proceedings of the Japan Concrete Institute, Vol.43, No.1, pp.881-886, 2021.6 [in Japanese]
3) Akihiro NAGATA, Kentaro OHNO, Kazukiyo TAMAKI, Atsushi UENO：Influence of Coarse aggregate and Saturation on the Relationship between Compressive Stress and Ultrasonic Velocity Variation in Concrete, Proceedings of the Japan Concrete Institute, Vol.43, No.1, pp.1121-1126, 2021.6 [in Japanese]
4) Narumi SHIDA, Kentaro OHNO, Kimitaka UJI and Atsushi UENO：Detection method for adhesion loss on interface between reinforcement and concrete based on elastic wave velocity structure, Proceedings of the Japan Concrete Institute, Vol.43, No.1, pp.1259-1264, 2021.6 [in Japanese]
5) Kentaro OHNO, Shinya UCHIDA, Masakazu HARUHATA and Satoshi IWANO：Damage evaluation in concrete by impact elastic wave method -debonding estimation between concrete and rebar-, Ultrasonic TECHNO, Vol.33, No.6, pp.9-13, 2021.12 [in Japanese]
6) Atsushi UENO and Kentaro OHNO：Application method of fine aggregate obtaining from volcanic sedimentation in Izu Island chain to concrete, Proceedings of symposium on utilization of volcanic sedimentation for concrete materials, Japan Concrete Institute, pp.37-40, 2022.3 [in Japanese]

【External Funding Sources】

・Collaborative research：3

【Social Contributions (Excluding confidential activities)】

・Japan Concrete Institute：2 committees
・Architectural Institute of Japan：1 committee
・The Japanese Society for Non-Destructive Inspection：6 committees

【Awards】

Encouraging prize of Annual conference：Akihiro NAGATA, Kentaro OHNO, Kazukiyo TAMAKI, Atsushi UENO ： Influence of Coarse aggregate and Saturation on the Relationship between Compressive Stress and Ultrasonic Velocity Variation in Concrete, Proceedings of the Japan Concrete Institute, Vol.43, No.1, pp.1121-1126, 2021.6 [in Japanese]

【Other Activities】

・Collaborative research with bureau of Construction Tokyo Metropolitan Government

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences

【Name】: Hiroshi SAKAI

【Position】: Associate Professor

【Research Topic】: Water and Wastewater Engineering, Water Environment Management, Water Quality Management

【Outline of research achievement】

Several studies were conducted for development and improvement for water and waste water treatment from environmental, social, and technological perspectives. Specific research area includes behavior of microplastics from tire wear particles, watershed forest management, water use at developing countries as well as degradation of pollutants by physical chemical treatment.

【Presentations】

No presentations at international conferences.

【Publications】

1) Shane Htet Ko and Hiroshi Sakai (2022) Water sanitation, hygiene and the prevalence of diarrhea in the rural area of delta region of Myanmar, Journal of Water and Health, 20(1), pp.149-156.
2) Guntur Adisurya Ismail and Hiroshi Sakai (2022) Review on Effect of Different Type of Dyes on Advanced Oxidation Processes (AOPs) for Textile Color Removal, Chemosphere, 291, 132906.
3) Yiming Fang and Hiroshi Sakai (2022) Use of an Ultraviolet Light activated Persulfate Process to Degrade Humic Substances: Effects of Wavelength and Persulfate Dose, Environmental Science and Pollution Research, 29, pp.9923-9931.
4) Shane Htet Ko and Hiroshi Sakai (2022) Perception on Water Quality, Current and Future Water Consumption of Residents from Central Business District of Yangon City, Water Supply, 22(1), 1094-1106.
5) Shane Htet Ko and Hiroshi Sakai (2021) Evaluation of Yangon City Tap Water Quality and the Efficacy of Household Treatment, Water Quality Research Journal、56(3): 155-166.
6) Shane Htet Ko, Keisuke Ishida, Zaw Myo Oo and Hiroshi Sakai (2021) Impacts of seawater intrusion on quality of groundwater in Htantabin Township of the deltaic region of southern Myanmar, Groundwater for Sustainable Development, 14, 100645
7) Shane Htet Ko, Anil Kumar Anal, Hiroshi Sakai (2021) Antibiotic resistance of fecal indicator bacteria from fishponds and nearby water sources in the Ayeyarwady Delta region of Myanmar, Limnology, 22, pages 357-362 (Asia/Oceania Report)

【External Funding Sources】

- JSPS Kakenhi, Development of water treatment technology with selectivity using sulfate radicals, PI, FY2019-2021
- Environment Research and Technology Development Fund, Spatio-temporal distribution of microplastics from tire wear particles and impact by traffic flow, PI, FY2020-2022
- Grant from Obayashi Foundation, Development of soft and hard measures against PPCPs in traditional water treatment where no water infrastructure covers, FY2020-2021
- Collaborative research with Tokyo Metropolitan Waterworks, Contribution by watershed forest on sediment deposition at Ogouchi Reservoir, Co-investigator, FY2020-2021

【Social Contributions (Excluding confidential activities)】

Member of IWA (International Water Association), ACS (American Chemical Society)

【Awards】

None

【Other Activities】

None

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences

【Name】: Tetsuya Shintani

【Position】: Associate professor

【Research Topic】: Coastal engineering, hydraulic engineering

【Outline of research achievement】

The measurement of spatial temperature distribution over a reservoir surface was realized using UAV with infrared camera and a newly developed image processing technique. We also improved our 3D hydrodynamic simulator to take account of nonuniformity of wind fields over the surface and enabled accurate predictions of wind-induced surface current. A deep learning model has developed to predict river surface level from rain fall and enabled accurate forecasts 3 hours ahead. We have developed multi-resolution SPH method to predict wave breaking and overtopping phenomena and confirmed its accuracy and efficiency. We submitted papers with the above topics and accepted in Japanese and international journals. The papers listed below are the accepted papers written in English.

【Presentations】

【Publications】

1) APPLICATION OF THE MODIFIED GAUSSIAN DISTRIBUTION METHOD TO REPRODUCE WATER TEMPERATURES OF THE OGOUCHI RESERVOIR, Duka, M., Yokoyama, K., Shintani, T., Sakai, H. and Koizumi, A., Journal of Japan Society of Civil Engineers Ser B1 (Hydraulic Engineering), 2021.

2) Analysis of interaction between morphology and flow structure in a meandering macro-tidal estuary using 3-D hydrodynamic modeling, Kirana Somsook, Neriezza A. Olap, Maurice A. Duka, Nagendram Veerapaga, Tetsuya Shintani, Katsuhide Yokoyama, Estuarine, Coastal and Shelf Science, Volume 264, 2022.

3) Effect of coastal boundary representation on basin-scale internal waves, Wataru Ito and Keisuke Nakayama and Tetsuya Shintani, Coastal Engineering Journal, 2021.

4) Mediating the Effects of Climate on the Temperature and Thermal Structure of a Monomictic Reservoir Through Use of Hydraulic Facilities, Duka, M., Yokoyama, K., Shintani, T., Water, 2021.

5) Effect of pycnocline thickness on internal solitary wave breaking over a slope, Nakayama, K., Iwata, R. and Shintani, T., Ocean Engineering, 2021.

【External Funding Sources】

JSPS KAKENHI Grant-in-Aid for Scientific Research, Principal Investigator: Tetsuya Shintani, FY2020-2022

【Social Contributions (Excluding confidential activities)】 JSCE member

【Awards】 None

【Other Activities】 None

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences
【Name】: Hitoshi NAKAMURA
【Position】: Associate Professor
【Research Topic】: Structural Engineering, Bridge Engineering, Engineering of Hybrid Structures
【Outline of research achievement】

Aiming primarily at bridges and steel structures in infrastructures, the survey, research and development have been performed as follows:

(1) Study on material and structural properties of GFRP members
(2) Study on enhancement of fatigue durability for welded joints using externally-bonded CFRP
(3) Seismic retrofitting of circular steel bridge piers by externally bonded carbon fiber sheets
(4) Development of repair and strengthening method for steel structures using VaRTM technique
(5) Evaluation of fatigue durability and debonding in adhesively bonded joints
(6) Investigation research on history of material, structure and design for bridges, and evaluation as modern cultural heritages in civil engineering

As a result, the fundamental data and valuable information for rational design, construction and maintenance in infrastructures have been obtained.

【Presentations】

1) Shingo Iwashita, Kuniei Nogami, Hitoshi Nakamura: Comparison of cross-section determinants and stability check of 4-span suspension bridge towers, Proc. of the 76th Annual Conference of JSCE, I-2, 2pages, Sept. 2021. (Online) [in Japanese]
2) Shogo Otake, Takahiro Kukidome, Tzuhan Hung, Hitoshi Nakamura, Hiroshi Iwabuki: Study on the effect of additional vertical girder measures against low frequency vibration of steel plate girder bridge, Proc. of the 76th Annual Conference of JSCE, I-57, 2pages, Sept. 2021. (Online) [in Japanese]
3) Takahiro Kukidome, Shogo Otake, Tzuhan Hung, Hitoshi Nakamura, Hiroshi Iwabuki: Setting of external force used for vibration analysis of bridges, Proc. of the 76th Annual Conference of JSCE, I-58, 2pages, Sept. 2021. (Online) [in Japanese]
4) Tzuhan Hung, Shogo Otake, Takahiro Kukidome, Hitoshi Nakamura, Hiroshi Iwabuki: A Study on the Estimation of Damping Coefficients of Bridges Using the Random Decrement Technique, Proc. of the 76th Annual Conference of JSCE, I-59, 2pages, Sept. 2021. (Online) [in Japanese]
5) Atsushi Matano, Hitoshi Nakamura, Visal Thay, Takehiko Tsubokawa, Takahiro Matsui: Repair effect of externally bonded CFRP on fatigue cracks initiated at in-plane welded gusset joints and crack propagation under weld residual stress, Proc. of the 76th Annual Conference of JSCE, I-280, 2pages, Sept. 2021. (Online) [in Japanese]
6) Shunsuke Hayashi, Hitoshi Nakamura, Visal Thay, Takehiko Tsubokawa, Takahiro Matsui: Effect of externally bonded CFRP on life prolongation of fatigue cracks initiated at out of plane welded gusset joints, Proc. of the

76th Annual Conference of JSCE, I-281, 2pages, Sept. 2021. (Online) [in Japanese]

7) Kumiko Kiyono, Visal Thay, Hitoshi Nakamura, Hisakazu Horii: Fabrication and its evaluation of testing device considering combined stress of bonded joints, Proc. of the 76th Annual Conference of JSCE, I-307, 2pages, Sept. 2021. (Online) [in Japanese]
8) Visal Thay, Kumiko Kiyono, Hitoshi Nakamura, Hisakazu Horii: Experimental study on tensile creep behavior of adhesively bonded joints, Proc. of the 76th Annual Conference of JSCE, I-308, 2pages, Sept. 2021. (Online)
9) Kim Oliver Untalan Magtagnob1, Hitoshi Nakamura1, Takahiro Matsui: Effect of Seismic Retrofitting by Graded Carbon Fiber Sheet Configuration on Circular Steel Bridge Pier, Proc. of the 76th Annual Conference of JSCE, CS2-33, 2pages, Sept. 2021. (Online)
10) Momoka Yokoyama, Hitoshi Nakamura: Evaluation of material properties of core member in GFRP sandwich panel slab and its fabrication using VaRTM, Proc. of the 76th Annual Conference of JSCE, CS6-18, 2pages, Sept. 2021. (Online) [in Japanese]
11) Daichi Nii, Kunitaro Hashimoto, Hitoshi Nakamura: Experimental study on behavior of GFRP materials, Proc. of the 76th Annual Conference of JSCE, CS6-23, 2pages, Sept. 2021. (Online) [in Japanese]
12) Atsushi Matano, Hitoshi Nakamura, Visal Thay, Takahiro Matsui: Effect of GFRP materials in VaRTM on crack repair using externally bonded CFRP, JRPS, 65th FRP CON-EX 2021, General oral presentation, 3pages, Nov. 2021. (Online) [in Japanese]

【Publications】

1) Yujiro Nishioka, Visal Thay, Hitoshi Nakamura, Takehiko Tsubokawa, Takahiro Matsui: Study on recovery and debonding behavior of steel members near stiffeners with sectional loss using externally bonded CFRP, Journal of Japan Society of Civil Engineers, Ser. A1 (Structural Engineering & Earthquake Engineering (SE/EE)), Vol.77, No.5, JSCE Journal of Hybrid Structures, Vol.8, pp.II_37-II_49, May 2021. [in Japanese]
2) Kumiko Kiyono, Thay Visal, Hitoshi Nakamura, Hisakazu Horii: Experimental study on evaluation of static bonding strength under combined stress, JSCE, Proc. of the 14th Symposium on Research and Application of Hybrid and Composite Structures, pp.5-1-5-8, Nov. 2021. [in Japanese]
3) Kim Oliver Untalan Magtagnob, Hitoshi Nakamura: Effect of graded carbon fiber sheet configuration on the seismic retrofit of circular steel bridge piers, JSCE, Proc. of the 14th Symposium on Research and Application of Hybrid and Composite Structures, pp.11-1-11-8, Nov. 2021.
4) Visal Thay, Kumiko Kiyono, Hitoshi Nakamura, Hisakazu Horii: Experimental study on tensile creep behavior of butt-bonded joints, JSCE, Proc. of the 14th Symposium on Research and Application of Hybrid and Composite Structures, pp.14-1-14-5, Nov. 2021.
5) Shunsuke Hayashi, Hitoshi Nakamra, Thay Visal, Takehiko Tsubokawa, Takahiro Matsui: Repair effect of externally bonded CFRP on fatigue cracks initiated at out-of-plane welded gusset joints, JSCE, Proc. of the 14th Symposium on Research and Application of Hybrid and Composite Structures, pp.17-1-17-9, Nov. 2021. [in Japanese]
6) Atsushi Matano, Hitoshi Nakamura, Visal Thay, Takehiko Tsubokawa, Takahiro Matsui: Repair effect of externally bonded CFRP on propagation life of fatigue cracks initiated at in-plane welded gusset joints, JSCE,

Proc. of the 14th Symposium on Research and Application of Hybrid and Composite Structures, pp.18-1-18-8, Nov. 2021. [in Japanese]

7) Takeshi Iwata, Momoka Yokoyama, Hitoshi Nakamura: Experimental study on structural characteristics of GFRP sandwich panel slab fabricated by VaRTM, JSCE, Proc. of the 14th Symposium on Research and Application of Hybrid and Composite Structures, pp.21-1-21-7, Nov. 2021. [in Japanese]
8) Hideki Hibi, Hitoshi Nakamura, Kunitomo Sugiura, Masayoshi Nasu: Experimental study on serviceability and safety of small FRP hydraulic gates, JSCE, Proc. of the 14th Symposium on Research and Application of Hybrid and Composite Structures, pp.31-1-31-8, Nov. 2021. [in Japanese]
9) Kim Oliver U. Magtagñob, Visal Thay, Hitoshi Nakamura, Takahiro Matsui: Elasto-Plastic behavior on seismic retrofitting for circular steel bridge pier by externally bonded carbon fiber sheets, CICE2020/2021 10th International conference on FRP composites in civil engineering, 14pages, Dec. 2021.
10) Visal Thay, Takumi Ozawa, Chang Tan, Hitoshi Nakamura, Takahiro Matsui: Fatigue Durability in welded gusset joints strengthened by carbon fiber sheets using VaRTM technique, CICE2020/2021 10th International conference on FRP composites in civil engineering, 13pages, Dec. 2021.

【External Funding Sources】

・JSPS KAKENHI, Grant Number: 21K04238, Investigator, Development of advanced strengthening technique for steel structures using externally bonded FRP members, 2021-2023.

【Social Contributions (Excluding confidential activities)】

・JSCE Committee of Hybrid structure, Member and Secretary
・JSCE Committee of Hybrid structure, Subcommittee on Continuing education in hybrid structures, Chair
・JSCE Committee of Hybrid structure, Subcommittee on Guidelines for performance-based design of hybrid structures, Member
・JSCE Committee of Hybrid structure, Subcommittee on evaluation of green and gray infrastructures, Member
・JSCE Committee of Hybrid structure, Subcommittee on Design and maintenance of FRP composite structures, Member and Secretary
・JSCE Committee of Structural engineering, Member
・JSCE Committee of Structural engineering, Subcommittee on Continuing Education, Chair
・JSCE Committee of Structural engineering, Editorial board on journal of structural engineering, Member
・JSCE Committee of Steel structures, Member
・JSCE Committee of Steel structures, Research committee on Update and utilization of database of historical steel bridges, Chair
・JSCE Committee of Steel structures, Research committee on Repair and strengthening of steel bridges, Member
・JSCE Committee on the History of civil engineering, Subcommittee on Historical and cultural value of post-war Infrastructures, Member
・JSCE Committee on the Construction management, Research committee on Public design competition, Member
・JSSC Subcommittee on future strategy of steel structures, Chair

・Japan Steel Bridge Engineering Association, Research Group on Design method of steel bridges considering maintenance, Chair
・FRP Hydraulic Gates Engineering Association, Advisor
・The Japan Reinforced Plastics Society, Director
・Tokyo Metropolitan University Alumni Association, Representative

【Awards】

(1) JSCE, the 14th Symposium on Research and Application of Hybrid and Composite Structures, Excellent Presentation Award
Shunsuke Hayashi, Hitoshi Nakamra, Thay Visal, Takehiko Tsubokawa, Takahiro Matsui: Repair effect of externally bonded CFRP on fatigue cracks initiated at out-of-plane welded gusset joints, JSCE, Proc. of the 14th Symposium on Research and Application of Hybrid and Composite Structures, pp.17-1-17-9, Nov. 2021. [in Japanese]

(2) JSSC, 2021 Best Paper Award (18th Nov., 2021)
Visal Thay, Takumi Ozawa, Chang Tan, Hitoshi Nakamura and Takahiro Matsui: Improvement of Fatigue Durability in Welded Gusset Joints by Carbon Fiber Sheets Using VaRTM Technique, JSSC, Steel Construction Engineering, Vol.27, No.105, pp.29-41, Mar. 2020. [in Japanese]

【Other Activities】

(1) Hitoshi Nakamura: Civil Engineering Works - Bridges, Britannica International Yearbook 2020, Britannica Japan Co., Ltd., pp.202-205, April 2021. [in Japanese]

(2) Hitoshi Nakamura: Introduction of Application of FRP Composites in Civil Engineering, Reinforced Plastics, Vol.67, No.5, pp.187-190, May 2021. [in Japanese]

(3) Hitoshi Nakamura and Kuniei Nogami: Theory and Practice of Non-linear Analysis, Vol.8, Basis and Application of Finite Element Method for Structural Engineering, Textbook for Lecture, JSCE Committee of Structural Engineering, Subcommittee on Continuing Education, pp.203-229, Dec. 2021. [in Japanese]

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences
【Name】: Mitsutoshi YOSHIMINE
【Position】: Associate Professor
【Research Topic】: Soil Mechanics, Geotechnical Engineering
【Outline of research achievement】

1) Undrained triaxial shear tests were performed on samples of silica sands with different grain shapes and crushability, having four different particle sizes and mixed samples thereof. Furthermore, experiments were also conducted on these samples with various fines contents.
2) We ensured the applicability and the suitability of the failure criteria proposed for the 3D principal stress states of sand, which have strength anisotropy due to the difference of the direction of the deposition.
3) It was clarified that the peculiarity of Inagi Sand such as large compressibility is due to its crushability rather than the particle size distribution such as fines content.

【Presentations】

1) "Effect of fines content on undrained shear properties of sand with different mean grain size and distribution range", WANG Zhaocheng, YOSHIMINE Mitsutoshi, 12-4-1-01, The 56th Japan National Conference on Geotechnical Engineering, 2021.
2) "Analytical study on strength properties of anisotropic materials with a plane of weakness", YOKOYA Haruaki, YOSHIMINE Mitsutoshi, 13-2-5-04, The 56th Japan National Conference on Geotechnical Engineering, 2021.
3) "Effect of fines contents on the steady state of Inagi Sand", WANG Zhaocheng, SUZUKI Sae, YOSHIMINE Mitsutoshi, Disaster prevention 1-3. The 18th Conference of Kanto Branch of The Japanese Geotechnical Society (Geo-Kanto2021), 2021.
4) "Particle crushability of Inagi Sand evaluated by triaxial compression test", SUZUKI Sae, WANG Zhaocheng, YOSHIMINE Mitsutoshi, Disaster prevention 1-4. The 18th Conference of Kanto Branch of The Japanese Geotechnical Society (Geo-Kanto2021), 2021.
5) "The effect of saturation degree on the steady-state strength of sands", MORI Misato, WANG Zhaocheng, YOSHIMINE Mitsutoshi, Disaster prevention 5-2. The 18th Conference of Kanto Branch of The Japanese Geotechnical Society (Geo-Kanto2021), 2021.
6) "Correlation of the dilatancy characteristics measured by constant pressure and constant volume direct shear box tests on sands", TAKEBE Kaito, YOSHIMINE Mitsutoshi, Materials 1-21. The 18th Conference of Kanto Branch of The Japanese Geotechnical Society (Geo-Kanto2021), 2021.
7) "Model of failure properties of anisotropic clay materials with plane of weakness", HAYASHI Shouma, YOKOYA Haruaki, YOSHIMINE Mitsutoshi, Materials 4-2. The 18th Conference of Kanto Branch of The Japanese Geotechnical Society (Geo-Kanto2021), 2021.

【Publications】

1) EFFECT OF PHYSICAL CHARACTERISTICS OF SANDS ON THE UNDRAINEDSHEAR BEHAVIOR IN THE STEADY STATE, Zhacheng Wang, Mitsutoshi Yoshimine, Journal of Geotechnical and Geoenvironmental Engineering, ASCE (Under review)

【External Funding Sources】none

【Social Contributions (Excluding confidential activities)】none

【Awards】none

【Other Activities】none

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences
【Name】: Hideo
【Position】: : Assistant Professor
【Research Topic】: Hydrology, River Engineering
【Outline of research achievement】
Buildings, roads, and farmlands are intricately distributed in rural basins, and it is difficult to faithfully represent them with a mesh. To analyze various scenarios in flood damage mitigation measures such as rice field dams by flood runoff analysis, it is necessary to model rural basins using "Landscape GIS data" that can faithfully reproduce complex land use. The purpose of this study is to construct a flood runoff analysis model for agricultural land-based watershed using Landscape GIS data. Flood runoff analysis was applied to the Amekawa watershed created as landscape GIS data, and it was confirmed that generally appropriate analysis values were obtained as a flood runoff analysis model from the river water level and the water depth distribution on the ground surface.

【Presentations】
1) K., Nakajima, H., Amaguchi, Y., Imamura, Examination of river water level estimation method using river monitoring camera of the Oguri River and point cloud data, II-70, Proc. of the 49th Kanto Branch Annual Conference of JSCE, Mar. 2022.
2) I., Aoki, H., Amaguchi and Y., Imamura, A Study on Creating Mountain Elements Using Digital Elevation Model (DEM), II-57, Proc. of the 49th Kanto Branch Annual Conference of JSCE, Mar. 2022.
3) K., Matsuda, H., Amaguchi, Y., Imamura, Hydraulic control function change over time in Kamiasao Nikkodai regulating pond，II-63，Proc. of the 49th Kanto Branch Annual Conference of JSCE, Mar. 2022.

【Publications】
1) H., Amaguchi, Y., Aoki and A., Kawamura, Development of Rural Storm Runoff Model Using Landscape GIS Data, Advances in River Engineering，Vol. 27, pp.511-516, June 2021.
2) J.R., Mercado, A., Kawamura, H., Amaguchi, C.J.Prudencio-Rubio, Fuzzy based multi-criteria M&E of the integrated flood risk management performance using priority ranking methodology: A case study in Metro Manila, Philippines, International Journal of Disaster Risk Reduction 64:102498, July 2021

【External Funding Sources】

“Study on urban storm runoff and inundation model using urban landscape GIS delineation technique” Principal Investigator, Grant-in-Aid for Scientific Research (C), 2019-2021.

【Social Contributions (Excluding confidential activities)】

【Awards】

【Other Activities】

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences
【Name】: Kosuke KAWATA
【Position】: Assistant Professor
【Research Topic】: Tunneling, Rock mechanics, Maintenance, Earthquake Engineering
【Outline of research achievement】
The following studies were conducted to obtain knowledge on the behavior of rock tunnels and mechanized tunnel under external forces.

1) The behavior of existing mountain tunnels during earthquakes and countermeasures against earthquakes.
2) The mechanical behavior of rock bolts made of different materials
3) The application conditions, methods and effects of reinforcement measures for existing tunnels
4) The effectiveness of auxiliary construction methods for mountain tunnels
5) The mechanical behavior of shield tunnel segments

【Presentations】

1) Laboratory test of seismic behavior of existing mountain tunnel portal: Akira MATSUOKA, Yuta YAMANISHI, Kosuke KAWATA, Nobuharu ISAGO, Kazuo NISHIMURA, Hiroshi YAGI, Hajime KITAMURA, Yasunori YOSHIDA, Proceedings of Japan Society of Civil Engineers (JSCE) No.77 Annual Meeting, 2021.9
2) Numerical analysis of seismic behavior of existing mountain tunnel portal: Yuta YAMANISHI, Akira MATSUOKA, Kosuke KAWATA, Nobuharu ISAGO, Kazuo NISHIMURA, Hiroshi YAGI, Hajime KITAMURA, Yasunori YOSHIDA, Proceedings of Japan Society of Civil Engineers (JSCE) No.77 Annual Meeting, 2021.9
3) Numerical analysis of the mechanical behavior of vertical pre-reinforcement: Tomohisa AMEMIYA, Tetsuya NAGATA, Nobuharu ISAGO, Kosuke KAWATA, Proceedings of Japan Society of Civil Engineers (JSCE) No.77 Annual Meeting, 2021.9

【Publications】

1) Consideration of the mechanical behavior of vertical pre-reinforcement: Tomohisa AMEMIYA, Tetsuya NAGATA, Nobuharu ISAGO, Kosuke KAWATA, Hiromichi SHIROMA, Kazuo NISHIMURA, Proceedings of the 31st Annual Conference on Tunnel Engineering, JSCE, 2021.11
2) Study on seismic behavior of existing mountain tunnel portal: Akira MATSUOKA, Yuta YAMANISHI, Kosuke KAWATA, Nobuharu ISAGO, Kazuo NISHIMURA, Hiroshi YAGI, Hajime KITAMURA, Proceedings of the 31st Annual Conference on Tunnel Engineering, JSCE, 2021.11
3) Study on rock bolt with different material by on-site and model experiment : Kosuke KAWATA, Takuma MATSUMOTO, Nobuharu ISAGO, Satoshi MORIMOTO, Dhota AWAJI, Tadashi OKABE, Proceedings of the 48th Symposium on Rock Mechanics, 2022.1

【External Funding Sources】

None

【Social Contributions (Excluding confidential activities)】

Member of Tunnel Engineering Committee, Japan Road Association

Member of Tunnel Engineering Committee, Japan Society of Civil Engineers

Member of Rock Mechanics Committee, Japan Society of Civil Engineers

Member of ITA Committee, Japan Society of Civil Engineers

Chair of Young Member Group, Japan Tunneling Association

【Awards】

None

【Other Activities】

1） 47th ITA General Assembly and Tunneling Week Report, Tunnels and Underground (shared writing), Vol.52, No,12, pp.61-66, 2021.12

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences
【Name】: Yusuke KISHI
【Position】: Assistant Professor
【Research Topic】: Structural Engineering, Disaster Mitigation, Seismic Engineering
【Outline of research achievement】

1) Research on Coupled Buckling Strength Evaluation for Compression Member of Steel Bridges.
In order to investigate the performance of evaluate the coupled buckling strength of H and I type cross-section members, characteristics of specimens using different steels for compressive strength tests were defined. In addition, compressive strength of specimens were calculated by finite element analysis. Moreover, initial local deflection of H and I type cross-section members were surveyed.
2) Numerical Simulations of Crowd Evacuation during Volcanic Disaster
In order to consider the initial position of evacuees depend on the buildings on the map, evacuation simulation was updated. In addition, evacuees which evacuate the second destination directly was also considered in the simulation. As the result of the simulation, initial position of evacuees significantly affects complete evacuation time.

【Presentations】

1) Ziping Huang, Jun Murakoshi, Kuniei Nogami, Yusuke Kishi: Numerical study on compressive strength evaluation of box type cross section member of truss bridges with uniform local section loss, Proc. of the 76th Annual Conference of JSCE, I-154, September, 2021. (in Japanese)

【Publications】

1) Ryotaro Ishikawa, Jun Murakoshi, Yusuke Kishi, Yasushi Josen, Mamoru Sawada, Daiki Tashiro : Study on estimation method of fatigue live load stress for fatigue evaluation of existing steel I -girder bridges, Journal of Structural Engineering, Vol. 67A, pp. 518-528, Japan Society of Civil Engineers, April 2021. (in Japanese)
2) R. Ishikawa, J. Murakoshi and Y. Kishi : Study on the load distribution factor for fatigue evaluation of steel girder bridges, 10th International Conference on Bridge Maintenance, Safety and Management(IABMAS 2020), April 11-18, 2021.
3) Tomoki Katayama, Jun Murakoshi, Kuniei Nogami : Numerical verification on the behavior of existing bridge's girder edges under lateral load of earthquake motion, Proc. of 24th symposium on seismic design for the bridges, pp. 171-178, July, 2021. (in Japanese)
4) Soichiro WADA, Jun Murakoshi, Kuniei NOGAMI, Yusuke KISHI : Numerical study on the behavior of corroded riveted girder bridge under lateral load, 29th JSSC Proc. of Constructional Steel, pp. 33-40, November 2021. (in Japanese)

【External Funding Sources】

Fundamental study on structural engineering, Research Donations for Steel structures, The Japan Iron and Steel Federation, 2021.

【Social Contributions (Excluding confidential activities)】

1) Subcommittee on survey and research for seismic performance verification of steel bridges using high-precision numerical analysis method, Committee on Steel Structure, Japan Society of Civil Engineers.
2) Subcommittee on survey and research for utilization of steel properties, Committee on Steel Structure, Japan Society of Civil Engineers.
3) Subcommittee for Standard Specifications for Steel and Composite Structure, Committee on Steel Structure, Japan Society of Civil Engineers.
4) Subcommittee of Young Structural Engineers, Committee on Structural Engineering, Japan Society of Civil Engineers.
5) Annual Conference Program Organization, General Affairs Department, Japan Society of Civil Engineers.
6) Subcommittee on Rationalization Design, Committee on Strengthening and Life Elongation Research for Steel Bridges, Japan Society of Steel Construction.

【Awards】

None

【Other Activities】

Research Member of Research Center for Volcanic Hazards and Their Mitigation, Tokyo Metropolitan University.

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences

【Name】: Masami Yanagihara

【Position】: Assistant professor

【Research Topic】: Traffic flow, Driving behavior, Traffic micro simulation, Public transportation

【Outline of research achievement】

1) In order to understand the driving behavior of the driver, by organizing the literature about the driving behavior, the model of driving behavior and latent drivers' stress and analyzed it based on the experimental results by the driving simulator and the estimation results using big data. In particular, the stress index considering the passage of time using biological reaction data of the experiment using the driving simulator, and performed a detailed analysis of the results of traffic simulation were analyzed.

2) The modeling results of fatigue and stress accumulation associated with resting behavior of general road users were demonstrated from traffic simulation results and questionnaire results.

【Presentations】

1) Resting Place Selection Model for Travels along Ordinary Roads, Masami YANAGIHARA, Wataro YAMASHITA, Hiroyuki ONEYAMAThe 14th EASTS International Virtual Conference, 2021.7.
2) Analysis of Resting Place Selection Behavior Along Ordinary Roads Based on Web Questionnaire, Wataro YAMASHITA, Masami YANAGIHARA, Hiroyuki ONEYAMA, The 14th EASTS International Virtual Conference, 2021.7.
3) Accessibility Evaluation Considering Consumed Calories - Case study in the Tokyo Coastal Sub-center Area -, Hiroyuki ONEYAMA, Masami YANAGIHARA, Yuki KAWABE, The 14th EASTS International Virtual Conference, 2021.7.
4) Fluctuation analysis of saturated traffic flow rate using sensor data, Yimin Gao, Oneyama Hiroyuki, Masami Yanagihara, Annual Conference of Japan Society of Traffic Engineers, Vol.40, 2021.9.
5) Comparative analysis of vehicle behavior for different signal lamp positions at complex intersection, Koki Komastu, Oneyama Hiroyuki, 柳原正実, Annual Conference of Japan Society of Traffic Engineers, Vol.40, 2021.9.
6) Comparison verification of saturation flow rate setting methods by observing for shared left-turn at signalized intersection, Tsubasa Takahashi, Oneyama Hiroyuki, Masami Yanagihara, Annual Conference of Japan Society of Traffic Engineers, Vol.40, 2021.9.
7) Convenience and capacity evaluation method for roadside station facilities as a transportation hub, Kenta Nagai, Masami Yanagihara, Oneyama Hiroyuki, Research Meeting on Civil Engineering Planning, vol.64, 2021.11.

8) Facility function evaluation by rest facility selection behavior model based on the utility of general road users, Wataro Yamashita, Masami Yanagihara, Oneyama Hiroyuki, Research Meeting on Civil Engineering Planning, vol.64, 2021.11.
9) Analysis of the relationship between driving intention and driving behavior of lane-changing considering stress indicators, Haruna Kondo, Masami Yanagihara, Oneyama Hiroyuki, Research Meeting on Civil Engineering Planning, vol.64, 2021.11.
10) Vehicle behavior analysis for different signal lamp positions focusing on intersection geometry, Koki Komastu, Oneyama Hiroyuki, Masami Yanagihara, Research Meeting on Civil Engineering Planning, vol.64, 2021.11.
11) SFR estimation method for left direct mixed lane using probability distribution of mean of headway time, Tsubasa Takahashi, Oneyama Hiroyuki, Masami Yanagihara, Research Meeting on Civil Engineering Planning, vol.64, 2021.11.
12) Quantitative evaluation of service levels for various terminal traffic, Kaito Fuchigami, Masami Yanagihara, Oneyama Hiroyuki, Research Meeting on Civil Engineering Planning, vol.64, 2021.11.
13) Utilization potential evaluation method as a transportation hub of roadside station, Kohei Kojima, Masami Yanagihara, Oneyama Hiroyuki, The 76th Annual Meeting of JSCE, IV-49, 2021.9.
14) Facility evaluation method focusing on traffic node function of roadside station, Kenta Nagai, Masami Yanagihara, Oneyama Hiroyuki, The 76th Annual Meeting of JSCE, IV-57, 2021.9.
15) An analysis of vehicle behavior for different signal lamp positions at complex intersection, Koki Komastu, Masami Yanagihara, Oneyama Hiroyuki, The 76th Annual Meeting of JSCE, IV-138, 2021.9.
16) Comparison verification of SFR setting methods by observing for shared left-turn at signalized intersection, Tsubasa Takahashi, Oneyama Hiroyuki, Masami Yanagihara, The 76th Annual Meeting of JSCE, IV-139, 2021.9.

【Publications】

・Comparative analysis of vehicle behavior for different signal lamp positions at complex intersection
Koki Komastu, Masami Yanagihara, Oneyama Hiroyuki
JSTE Journal of Traffic Engineering, 2022

【External Funding Sources】

2019-2021, Optimization of traffic flow by intervention for autonomous vehicles,
KAKENHI-PROJECT- 19H02268, Co-Investigator
2019-2021, New CART (Committee on Advanced Road Technology), Vol.36, “Technology research that contributes to improving the quality of road policies”, Co-Investigator
2020-2022, 5RF-2006, Environmental Restoration and Conservation Agency, ERCA

【Social Contributions (Excluding confidential activities)】

Member, Japan Society of Civil Engineers (JSCE)

Member, Japan Society of Traffic Engineers (JSTE)

【Awards】

【Other Activities】

Annual Report (English Version)

【Department】: Department of Civil and Environmental Engineering, Faculty of Urban Environmental Sciences
【Name】: Gubash AZHIKODAN
【Position】: Assistant Professor
【Research Topic】: Estuarine hydro- and morphodynamics, Cohesive sediment transport, Phytoplankton dynamics
【Outline of research achievement】

1) The seasonal riverbed fluctuation at the estuarine turbidity maximum (ETM) zone of the macrotidal Chikugo River estuary, Japan was studied using the intensive periodical transverse surveys of riverbed topography and sediment sampling along with continuous monitoring of water level, salinity and turbidity. The estuarine channel experienced gradual deposition by the tide-induced sediment transport during the dry season of 2020. The channel capacity rapidly increased due to the erosion of these mud deposits by the strong flood in 2020 that exported the sediment downstream. The bed elevation rises again during the post flood season by the tidal forcing and continues until the next flood in August 2021. The erosion was more severe in 2020 than in 2021 due to the difference in peak floods. On a long-term scale, the channel bed showed a decreasing trend from 2003-2021 due to the high flood magnitude in recent years. The riverbed elevation showed a decreasing trend on a long-term scale, although the topography of the estuarine channel maintains a dynamic equilibrium on a seasonal scale.

2) The spatio-temporal hydrodynamics of the multi-branched tropical Tanintharyi River estuarine (TRE) system in Myanmar were studied and addressed the following four key questions of concern in multi-branched estuaries: (i) how the seasonal variations in river discharge will affect the estuarine processes; (ii) how the neap-spring tidal variability will affect the estuarine processes; (iii) how the hydrodynamic processes in a multi-branched estuary will vary spatially; (iv) what are the dominant factors that affect the hydrodynamics in a macrotidal monsoon estuary. The salinity intrusion, mixing and sediment transport in the estuary exhibited both spatial and temporal (neap-spring tidal and seasonal) variability. Further, the length and shape of each branches affected these estuarine processes. It was found that the turbidity maximum zones are not associated with a singular salinity, which is a different phenomenon that has been previously reported in tide-dominated estuaries. Finally, the hydrodynamic processes in the TRE were influenced by the strong tidal flow during the dry season whereas both the river flow and tidal flow during the wet season. The results were also compared with the hydrodynamic processes in the Chikugo River estuary, Japan and found that the relationship between salinity and turbidity were nearly linear in Chikugo River estuary compared to the TRE. The study will be an initial step to understanding the hydrodynamic processes of estuaries in developing Asian countries.

【Presentations】

1) Nwe, L.W., Azhikodan, G., Yokoyama, K., 2021. Influence of salinity intrusion and suspended sediment concentration (SSC) on temporal distribution of diatoms (phytoplankton) in the Chikugo River estuary. River, Coastal and Estuarine Morphodynamics (RCEM) conference 2021. Session: Ecomorphodynamics. 02 December 2021 (10:25 - 10:50 CET).
2) Hlaing, N.O., Azhikodan, G., Yokoyama, K., 2021. Seasonal Variations of salinity intrusion and mixing conditions at Tanintharyi River estuary. River, Coastal and Estuarine Morphodynamics (RCEM) conference 2021. Session: Morphodynamics and sediment transport. 09 December 2021 (17:25 - 17:50 CET).
3)

【Publications】

1) Somsook, K., Azhikodan, G., Duka, M., Yokoyama, K., 2021. Riverbed fluctuation and erosion property of cohesive sediment based on long-term topographic surveys in a macrotidal estuary. Regional Studies in Marine Science 45, 101848. June 2021.
2) Azhikodan, G., Hlaing, N.O., Yokoyama, K., Kodama, M., 2021. Spatio-temporal variability of the salinity intrusion, mixing, and estuarine turbidity maximum in a tide-dominated tropical monsoon estuary. Continental Shelf Research 225, 104477. August 2021.
3)

【External Funding Sources】

1) Principal Investigator, JSPS KAKENHI Grant-in-Aid for Early-Career Scientists, Analysis of morphodynamic evolution in a meandering estuarine channel in the context of climate change, April 2020 to March 2024.
2) Member (PI - Katsuhide Yokoyama), Advanced Research project, Prevention of water pollution caused by the floating waste disposal from mega cities in the context of global warming and COVID19 lockdowns, Tokyo Metropolitan Government, April 2022 to March 2025.

【Social Contributions (Excluding confidential activities)】

Japan Society of Civil Engineers
Asia Oceania Geosciences Society

【Awards】

【Other Activities】

1. Conducted online internship in the field of "Hydrodynamic Studies on Estuaries" during April-September 2021 for the two undergraduate students from TKM College of Engineering, Kollam, Kerala, India.

2. Managed a session entitled, “Estuarine contaminant dynamics – Assessing the impact of human interventions” as co-convener in CERF 2021 Biennial Conference on 11 November 2021 by collaborating with researchers abroad.
3. Presented keynote address entitled “Scope of higher studies in agricultural and water resources engineering in TMU and Japan” in the international conference on innovative agricultural engineering and food technology during 28 and 29 December 2021 conducted by Sri Shakthi Institute of Engineering & Technology, India.