Michio Honda

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INTERESTS

Computer Networks, Operating Systems and Security

EDUCATION

Keio University, Tokyo, Japan

Ph.D. in Graduate School of Media and Governance, Cyber Informatics — Apr 2009 – Mar 2012
Thesis: The Internet is not an Internet—Principles, Evasion and Implications for Transport Protocols

M.S. in Graduate School of Media and Governance, Cyber Informatics — Apr 2007 – Mar 2009
Thesis: Bidimensional-Probe Multipath Congestion Control for Shared Bottleneck Fairness

B.S. in Faculty of Environment and Information Studies — Apr 2003 – Mar 2007
Thesis: Fast Transport Layer Handover Using Single Wireless Interface

EMPLOYMENT

University of Edinburgh, School of Informatics, Edinburgh, UK
Reader (Associate Professor) — Aug 2024 – present
Lecturer in Networked Systems (Assistant Professor) — Jan 2020 – Jul 2024

Senior researcher, **NEC** Laboratories Europe, Heidelberg, Germany — Nov 2016 – Dec 2019
Software engineer, **NetApp**, Munich, Germany — Dec 2014 – Oct 2016
Research scientist, **NEC** Laboratories Europe, Heidelberg, Germany — Jul 2012 – Nov 2014

OTHER EXPERIENCE

Visiting student researcher, University College London (UCL), London, UK — Apr 2010 – Sep 2010
Advisor: Prof. Mark Handley
Focus: Middlebox, Multipath Transport Protocol.

Research intern, Nokia Research Center, Espoo, Finland — Jul 2008 – Jan 2009
Advisor: Dr. Lars Eggert
Focus: Multipath Transport Protocol.

AWARDS

Google Research Scholar Award * — Apr 2022
Facebook Research Award * — Aug 2021
Best paper award, ACM SOSR'15 * — Jun 2015
Community award, USENIX NSDI'12 — Apr 2012
IRTF Applied Networking Research Prize (ANRP) * — Nov 2011
* as the sole recipient or lead author

SELECTED PROJECTS

Secure Datacenter Transport Protocol Design — Oakland'26, NDSS'26
SMT is a new encrypted transport protocol design. It aims to replace TLS/TCP with low-latency properties of emerging datacenter transports like Homa. SMT refines TLS with per-message record sequence number spaces to avoid head-of-line blocking, while preventing replay attacks. To support high session churn, Looma enables low-latency TLS handshake with post-quantum resistance and mutual authentication in the cloud using online-offline signature paradigm.

Flexible TCP Scale-Out — APNet'25, NSDI'21
Prism enables content-aware routing of arbitrary-sized, encrypted application data over TCP, unlike the existing systems that rely on a custom UDP-based protocol. Prism modernizes the TCP handoff in the aid of programmable switches for robust operation and conformance to relevant features in recent Linux kernels.

Network Stack Design for Modern Hardware — ATC'25, HotNets'21, NSDI'18, HotNets'16, ATC'16
PASTE is a network stack that offers unified abstractions of network and non-volatile main memory. It fills the gap between the storage and network stacks designed in isolation, and solves the problem with the costs of moving and transforming data between these stacks that are significant for non-volatile main memory that offers fast, byte-addressable persistence.

High-Performance Virtual Networking — SOSR'15, CCR'14, NSDI'14, SoCC'17
mSwitch solves the scalability problem of existing software switches that is crucial to consolidate a large number of VMs or virtualized network functions by a novel packet forwarding algorithm and streamlined data path. It was initially designed for ClickOS, a tiny unikernel that runs Click, and MultiStack, a framework that runs multiple user-space network stacks.

Middlebox Measurement for TCP Extensibility — IMC'11, NSDI'12
This work was motivated by exploring viable design of Multipath TCP. It transmits various non-existent TCP traffic that mimics possible future TCP extensions to our server and examines on-path actions to the packets. This is the first work that examines in-depth middlebox behaviour prevalent in the Internet.

PROFESSIONAL SERVICE

UNIVERSITY OF EDINBURGH

	People and Culture committee	2022–present
	Programming Club, organizer	2020–present
	PROFESSIONAL SOCIETY	
	ACM SIGOPS, CARES Committee co-chair	2023–present
	IRTF ANRP Award Committee	2022–present
	ACM SIGOPS, CARES Committee	2021–2022
	CONFERENCE PROGRAM COMMITTEE	
	USENIX NSDI (2023, 2026), ACM EuroSys (2021, 2024–2026), USENIX OSDI (2025–2026), ACM SIGCOMM (2024–2026), ACM APSYS (2024–2025), ACM HotNets (2024), ACM ASPLOS (2024), USENIX ATC (2017, 2018, 2020–2024), ACM HotStorage (2022–2025), ACM/IEEE ANCS (2018, 2021 (co-chair)), ACM CoNEXT (2021–2022), ACM/IEEE SC (2019), ACM SOSR (2018), ACM EuroDW (2018, ACM/IEEE ToN (2017–2018), ACM SOSP poster (2013)	
TEACHING	**Introduction to Programming (Informatics) Summer**, University of Edinburgh	July 2021 and 2022
	Computer Communications and Networks, University of Edinburgh	Fall 2021–present
	Data Structures and Programming, Keio University	Fall 2011
	Fundamentals of Information Technology, Keio University	Spring 2011
MENTORING	**UNIVERSITY OF EDINBURGH**	
	Elisaveta Lavrentieva, PhD supervision (equal co-supervision with Marc Juarez)	Fall 2024
	Michael Zhang, Internship mentoring (ICSA Summer Internship)	Summer 2024
	Eugenio Luo, Internship mentoring (EPSRC Vacation Internship)	Summer 2024
	Xinshu Ma, PhD supervision	Fall 2023
	Tianyi Gao, PhD supervision	Fall 2022
	Tianyi Gao, MSc and intern supervision	Spring 2022
	Steven W. D. Chien, Postdoc → assistant professor at the University of St Andrews.	March 2022–September 2025
	Shuo Li, PhD supervision	Fall 2021
	Shinichi Awamoto, PhD supervision	Spring 2021
	NETAPP	
	Nanako Momiyama, BSc thesis supervision, Keio University	Fall 2016
	Yutaro Hayakawa, BSc thesis intern at NetApp, Keio University	Fall 2016
	Kenichi Yasukata, MSc thesis intern at NetApp, Keio University	Fall 2015
	NEC LABS EUROPE	
	Shinichi Awamoto, intern at NEC, Tokyo University	Fall 2019
	Yutaro Hayakawa, MSc thesis intern at NEC, Keio University	Fall 2018
	Nanako Momiyama, intern at NEC	Spring 2017
	Kenichi Yasukata, mentor at NEC	Fall 2016
GRANTS	**GLOBAL**	
	NetApp Faculty Fellowship, $50K, sole PI Towards Generic, Encrypted Datacenter Transport	Jan 2023
	Google Research Scholar Award, $60K, sole PI Upcycling Packets as Persistent In-Memory Data Structures	May 2022
	Facebook Research Award, $50K, sole PI Flexible transport scale-out with modern NICs	Nov 2021
	REGIONAL (UK/EU)	
	EPSRC Core Equipment Award, £50K (my share), Co-I (my part) Systems Research Testbed	Jan 2025 – Jun 2026
	Royal Society Research Grant, £20K, sole PI Confidential Computing at a Scale	Oct 2024 – Oct 2025
	EPSRC Core Equipment Award, £35K (my share), Co-I (my part) Systems Research Testbed	Jan 2023 – Mar 2023
	EPSRC New Investigator Award, £385K, sole PI NetPM: Co-designing Data Management and Networking Principles for Persistent Memory	Apr 2022 – Mar 2025
	NCSC RISE Proof-of-Concept, £45K, co-PI Follow on Project: Gupt - A Hardware Assisted Secure and Private Data Analytics	Oct 2021 – Mar 2022
OTHER HONORS	**Nominee for Teaching Award**, Outstanding Course category, University of Edinburgh	Apr 2023
STUDENT SCHOLARSHIP	**Research Fellowship for Young Scientists (DC1)** Japan Society for the Promotion of Science, 9.2M JPY	Apr 2009 – Mar 2012
	Excellent Young Researcher Overseas Visit Program	Apr 2010

Japan Society for the Promotion of Science, 1M JPY
Young Leader Scholarship Apr 2009
Keio University, 1M JPY

SELECTED PUBLICATIONS

Tianyi Gao, Xinshu Ma, Suhas Narreddy, Eugenio Luo, Steven Chien and **Michio Honda**, *"Designing Transport-Level Encryption for Datacenter Networks"*, IEEE Symposium on Security and Privacy (**S&P "Oakland"**), May 2026.

Xinshu Ma and **Michio Honda**, *"Looma: A Low-Latency PQTLS Authentication Architecture for Cloud Applications"*, ISOC Network and Distributed System Security Symposium (**NDSS**), Feb 2026.

Elisaveta Lavrentieva, Marc Juarez and **Michio Honda**, *"Rethinking the Role of Network Stacks for Website Fingerprinting Defenses"*, ACM Workshop on Hot Topics in Networks (**HotNets**), Nov 2025.

Steven W.D. Chien, Kento Sato, Artur Podobas, Niclas Jansson, Stefano Markidis and **Michio Honda**, *"ParaLog: Consistent Host-Side Logging for Parallel Checkpoints'*, ACM Symposium on Cloud Computing (**SoCC**), Nov 2025.

Shuo Li*, Steven Chien*, Tianyi Gao and **Michio Honda**, *"Designing Transport-Level Encryption for Datacenter Networks"*, ACM Asia-Pacific Workshop on Networking (**APNet**), Aug 2025.

Shinichi Awamoto and **Michio Honda**, *"Opening Up Kernel-Bypass TCP Stacks"*, USENIX Annual Technical Conference (**ATC**), Jul 2025.

Michio Honda, *"Packets as Persistent In-Memory Data Structures"*, ACM Workshop on Hot Topics in Networks (**HotNets**), Nov 2021.

Yutaro Hayakawa, **Michio Honda**, Douglas Santry and Lars Eggert, *"Prism: Proxies without the Pain"*, USENIX Symposium on Networked Systems Design and Implementation (**NSDI**), Apr 2021.

Shinichi Awamoto, Erich Focht and **Michio Honda**, *"Designing a Storage Software Stack for Accelerators"*, USENIX Workshop on Hot Topics in Storage and File Systems (**HotStorage**), Jul 2020.

Maurice Bailleu, Jörg Thalheim, Pramod Bhatotia, Christof Fetzer, **Michio Honda** and Kapil Vaswani, *"Speicher:Securing LSM-based Key-Value Stores using Shielded Execution"*, USENIX Conference on File and Storage Technologies (**FAST**), Feb 2019.

Salvatore Pontarelli, Roberto Bifulco, Marco Bonola, Carmelo Cascone, Marco Spaziani, Valerio Bruschi, Davide Sanvito, Giuseppe Siracusano, Antonio Capone, **Michio Honda**, Felipe Huici and Giuseppe Bianchi, *"FlowBlaze: Stateful Packet Processing in Hardware"*, USENIX Symposium on Networked Systems Design and Implementation (**NSDI**), Feb 2019.

Michio Honda, Giuseppe Lettieri, Lars Eggert and Douglas Santry, *"PASTE: A Network Programming Interface for Non-Volatile Main Memory"*, USENIX Symposium on Networked Systems Design and Implementation (**NSDI**), Apr 2018.

Kenichi Yasukata, Felipe Huici, Vincenzo Maffione, Giuseppe Lettieri and **Michio Honda**, *"HyperNF: Building a High Performance, High Utilization and Fair NFV Platform"*, ACM Symposium on Cloud Computing (**SoCC**), Sep 2017.

Simon Kuenzer, Anton Ivanov, Filipe, Manco, Jose Mendes, Yuri Volchkov, Florian Schmidt, Kenichi Yasukata, **Michio Honda** and Felipe Huici, *"Unikernels Everywhere: The Case for Elastic CDNs"*, ACM International Conference on Virtual Execution Environments (**VEE**), Apr 2017.

Michio Honda, Lars Eggert and Douglas Santry, *"PASTE: Network Stacks Must Integrate with NVMM Abstractions"*, ACM Workshop on Hot Topics in Networks (**HotNets**), Nov 2016.

Kenichi Yasukata, **Michio Honda**, Douglas Santry and Lars Eggert, *"StackMap: Low-Latency Networking with the OS Stack and Dedicated NICs"*, USENIX Annual Technical Conference (**ATC**), Jun 2016.

Michio Honda, Felipe Huici, Giuseppe Lettieri and Luigi Rizzo, *"mSwitch: A Highly-Scalable, Modular Software Switch"*, ACM SIGCOMM Symposium on SDN Research (**SOSR**), Jun 2015. **Best paper award**

Michio Honda, Felipe Huici, Costin Raiciu, Joao Araujo and Luigi Rizzo, *"Rekindling Network Protocol Innovation with User-Level Stacks"*, ACM SIGCOMM Computer Communication Review (**CCR**), Apr 2014.

Joao Martins, Mohamed Ahmed, Costin Raiciu, Vladimir Olteanu, **Michio Honda**, Roberto Bifulco and Felipe Huici, *"ClickOS and the Art of Network Function Virtualization"*, USENIX Symposium on Networked Systems Design and Implementation (**NSDI**), Apr 2014.

Costin Raiciu, Christoph Paasch, Sebastien Barre, Alan Ford, **Michio Honda**, Fabien Duchene, Olivier Bonaventure and Mark Handley, *"How Hard Can It Be? Designing and Implementing a Deployable Multipath TCP"*, USENIX Symposium on Networked Systems Design and Implementation (**NSDI**), Apr 2012. **Community Award**

Michio Honda, Yoshifumi Nishida, Costin Raiciu, Adam Greenhalgh, Mark Handley and Hideyuki Tokuda, *"Is it Still Possible to Extend TCP?"* ACM Internet Measurement Conference (**IMC**), Nov 2011. **Applied Networking Research Prize**

Michio Honda, Yoshifumi Nishida, Pasi Sarolahti and Lars Eggert, *"Multipath Congestion Control for Shared Bottleneck"* International Workshop on Protocols for Future, Large-Scale & Diverse Network Transports (**PFLDNeT**), May 2008.

Michio Honda, Jin Nakazawa, Yoshifumi Nishida, Masahiro Kozuka and Hideyuki Tokuda, *"A Connectivity-Driven Retransmission Scheme Based On Transport Layer Readdressing"*, IEEE International Conference on Distributed Computing Systems (**ICDCS**), Jun 2008.

PREPRINTS

OPEN SOURCE CONTRIBUTION **(by myself, not mentees)**	PASTE	https://micchie.github.io/paste/
	netmap	mSwitch and various features https://github.com/luigirizzo/netmap
	MultiStack	https://github.com/sysml/multistack
	Linux kernel	SCTP extensions https://www.kernel.org/
	FreeBSD kernel	mSwitch and SCTP extensions https://www.freebsd.org/

[*CV compiled on 2025-12-08*]