

# Michio Honda

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<b>INTERESTS</b>	<b>Computer Networks, Operating Systems and Security</b>		
<b>EDUCATION</b>	<b>Keio University</b> , Tokyo, Japan		
	<b>Ph.D.</b> 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		
	<b>M.S.</b> in Graduate School of Media and Governance, Cyber Informatics	Apr 2007 – Mar 2009	
	Thesis: Bidimensional-Probe Multipath Congestion Control for Shared Bottleneck Fairness		
	<b>B.S.</b> in Faculty of Environment and Information Studies	Apr 2003 – Mar 2007	
	Thesis: Fast Transport Layer Handover Using Single Wireless Interface		
<b>EMPLOYMENT</b>	<b>University of Edinburgh, School of Informatics</b> , Edinburgh, UK		
	<b>Reader</b> (Associate Professor)	Aug 2024 – present	
	<b>Lecturer in Networked Systems</b> (Assistant Professor)	Jan 2020 – Jul 2024	
	<b>Senior researcher</b> , NEC Laboratories Europe, Heidelberg, Germany	Nov 2016 – Dec 2019	
	<b>Software engineer</b> , NetApp, Munich, Germany	Dec 2014 – Oct 2016	
	<b>Research scientist</b> , NEC Laboratories Europe, Heidelberg, Germany	Jul 2012 – Nov 2014	
<b>OTHER EXPERIENCE</b>	<b>Visiting student researcher</b> , University College London (UCL), London, UK		
	Advisor: Prof. Mark Handley	Apr 2010 – Sep 2010	
	Focus: Middlebox, Multipath Transport Protocol.		
	<b>Research intern</b> , Nokia Research Center, Espoo, Finland	Jul 2008 – Jan 2009	
	Advisor: Dr. Lars Eggert		
	Focus: Multipath Transport Protocol.		
<b>AWARDS</b>	<b>Google Research Scholar Award</b> *	Apr 2022	
	<b>Facebook Research Award</b> *	Aug 2021	
	<b>Best paper award</b> , ACM SOSR'15 *	Jun 2015	
	<b>Community award</b> , USENIX NSDI'12	Apr 2012	
	<b>IRTF Applied Networking Research Prize (ANRP)</b> *	Nov 2011	
	* as the sole recipient or lead author		
<b>SELECTED PROJECTS</b>	<b>Secure Datacenter Transport Protocol Design</b>	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.		
	<b>Flexible TCP Scale-Out</b>	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.		
	<b>Network Stack Design for Modern Hardware</b>	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.		
	<b>High-Performance Virtual Networking</b>	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.		
	<b>Middlebox Measurement for TCP Extensibility</b>	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.		
<b>PROFESSIONAL SERVICE</b>	<b>UNIVERSITY OF EDINBURGH</b>		

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

**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 Bailieu, 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

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