

Emilia Ndilokelwa Weyulu

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"The function of freedom is to free someone else." - Toni Morrison

Summary

Final-year Ph.D. researcher in Internet transport protocols with the Internet Architecture group at the Max Planck Institute for Informatics. I designed and implemented a platform for evaluating Internet congestion control protocols (TCP) using empirical data from experimental and simulated network scenarios. My work focuses on optimizing algorithms for efficient data transmission, reduced latency, and enhanced reliability in Ethernet-based networks.

I gained practical research experience through a 6-month internship at the Huawei Munich Research Center, where I worked on the ROSA project, implementing and evaluating eBPF-based packet processing to reduce network service latencies. Additionally, I have over 4 years of experience as a data transmission technician at a telecommunications company in Namibia, specializing in carrier service provisioning and routing.

After completing my Ph.D., I am seeking research opportunities focused on advancing networking technologies, particularly in areas such as congestion control for low-latency, high-throughput applications.

Education

Max Planck Institute for Informatics (Saarland University)

Saarbuecken, Germany

PH.D IN COMPUTER SCIENCE

May 2019 - Current

- **Thesis:** Designing a benchmark for identifying and overcoming the shortcomings of congestion control algorithms
- **Advisor:** Prof. Anja Feldmann

Tokyo University of Information Sciences

Chiba, Japan

MASTERS (M.Sc.) IN INFORMATICS

Mar. 2016 - Mar. 2018

- **Thesis:** Asymmetric RTS/CTS for Exposed Node Reduction
- **Advisor:** Prof. Moo Wan Kim

Namibia University of Science and Technology

Windhoek, Namibia

MASTERS (M.Sc.) IN COMPUTER SCIENCE

Mar. 2014 - Oct. 2017

- **Thesis:** A Rate Adaptive and Forward Error Correction Scheme for Video Streaming in 802.11b WLANs
- **Advisor:** Prof. Guy-Alain Lusilao Zodi

University of Namibia

Windhoek, Namibia

BACHELOR (B.Sc.) IN COMPUTER SCIENCE AND STATISTICS

Feb. 2006 - Oct. 2017

- **Thesis (Computer Science):** Server Resource Monitoring for the Computer Science Department
- **Advisor:** Mr. John Mutuku
- **Thesis (Statistics):** The analysis of academic facilities and social support services at the University of Namibia
- **Advisor:** Dr. Petrus T. Iiyambo

Publications

- | | | |
|-----------------|--|--------------------------|
| 2024
Conf. | D. Zeynali, E.N. Weyulu, S. Fathalli, B. Chandrasekaran, and A. Feldmann , BBRv3 in the public Internet: a boon or a bane? Applied Networking Research Workshop (ANRW) | Vancouver, Canada |
| 2024
Conf. | E.N. Weyulu, and D. Trossen , Exploring The Benefits of In-Band Service Routing. IFIP Networking Conference (IFIP Networking) | Thessaloniki, Greece |
| 2024
Conf. | D. Zeynali, E.N. Weyulu, S. Fathalli, B. Chandrasekaran, and A. Feldmann , Promises and Potential of BBRv3. Passive and Active Measurement Conference (PAM) | Virtual, USA |
| 2019
Conf. | A. Feldmann, B. Chandrasekaran, S. Fathalli, and E.N. Weyulu , P4-enabled network-assisted congestion feedback: A case for nacks. Workshop on Buffer Sizing (BS'19) | Palo Alto, USA |
| 2018
Journal | E. Weyulu, M. Hanada, H. Kanemitsu, E.C. Park, and M.W. Kim , Cross-layer design for exposed node reduction in ad hoc WLANs. IEICE Transactions on Communications) | Tokyo, Japan |
| 2017
Conf. | E. Weyulu, M. Hanada, and M.W. Kim , Optimizing RTS/CTS to improve throughput in ad hoc WLANs. Federated Conference on Computer Science and Information Systems (FedCSIS) | Prague, Czech Republic |
| 2017
Conf. | S. Hashimoto, E.N. Weyulu, K. Hajikano, H. Kanemitsu, and M.W. Kim , Evaluation of task clustering algorithm by FFT for heterogeneous distributed system. International Conference on Advanced Communication Technology (ICACT) | PyeongChang, South Korea |
| 2017
Conf. | E. Weyulu, T. Iwabuchi, M. Takeshi, M. Hanada, and M.W. Kim , Ad hoc WLAN throughput improvement by reduction of RTS range. International Conference on Advanced Communication Technology (ICACT) | PyeongChang, South Korea |

2017 Journal	H. Kanemitsu, M. Hanada, E.N. Weyulu, and M.W. Kim , On the performance of a clustering-based task scheduling in a heterogeneous system. Advances in Science, Technology and Engineering Systems Journal (ASTESJ)	California, USA
2023 Conf.	E.N. Weyulu, and G.A. Lusilao-Zodi , A dynamic forward error control scheme for video streaming over wireless networks. International Conference on Computing, Networking and Communications (ICNC)	Kauai, HI, USA

Relevant Experience

Max Planck Institute for Informatics

Saarbruecken, Germany

RESEARCH ASSISTANT (PHD)

May 2019 - Current

- PhD Student in Internet Architecture researching the performance and evaluation of congestion control algorithms on the Internet.
- Teaching Assistant responsible for Masters and Bachelors course Data Networks and Hot Topics in Data Networks Seminar.
- Mentoring undergraduate and graduate students for thesis and semester projects on network transport protocols.
- Publication and presentation of research output at international conferences, including IETF meetings.

Applied Network Technology Laboratory, Huawei Munich Research Center

Munich, Germany

INTERNSHIP

Feb. 2023 - Aug. 2023

- Research use cases to showcase the benefits of Service Routing in practice using the ROSA mechanism.
- Implement and evaluate a Service Routing prototype in Linux Ubuntu using eBPF-based packet processing and user-space socket libraries.
- Published research output at the 2024 IFIP Networking Conference in Thessaloniki, Greece

Global Business Development, SoftBank Group

Tokyo, Japan

MARKET RESEARCH INTERNSHIP

Mar. 2018 - Jul. 2018

- FinTech: Research into mobile money and the e-payment ecosystem in Africa and South East Asia.
- Development of a FinTech business strategy tailored for the African market.

Telecom Namibia

Windhoek, Namibia

NETWORK TECHNICIAN (IP/TDM/METRO-ETHERNET BACKHAULING)

Mar. 2011 - Aug. 2015

- VPN implementation for corporate clients using copper and fiber optics technologies (MPLS and Metro-E).
- Network planning, design, and implementation including IP planning and customer site equipment installation.
- Configuring, testing, and troubleshooting end-user equipment for use in corporate VPNs and internet access.
- Installation and updating of software on cluster servers, mapping of network drives, joining of users to Active Directory.

Telecom Namibia

Windhoek, Namibia

NETWORK SYSTEMS INTERNSHIP

Feb. 2010 - Jan. 2011

- Internship in Design, Engineering, Planning, and Implementation (DEPI) department to support the engineering team in design, implementation, and operation of network solutions, ongoing customer projects, e.g. VPN installation, VoIP migration, and 1st level support and troubleshooting in Network Operation Center.
- **Learned Skills:** LAN and WAN configurations, Network design and implementation, Customer site equipment installation, IP planning

Teaching Experience

Hot Topics in Data Networks Seminar – Saarland University

Saarbruecken, Germany

TEACHING ASSISTANT

Apr. 2020 - Current

- **Teaching Assistant, Course organizer:** Masters and Bachelor seminar course discussing state-of-the-art research and recent findings published at top conferences in the Computer Networking domain.
- **Responsibilities:** Planning course contents, organizing tutors, advising students, grading student work.

Data Networks – Saarland University

Saarbruecken, Germany

TEACHING ASSISTANT

Apr. 2019 - Current

- **Teaching Assistant, Course organizer:** Masters and Bachelor course on the principles of Computer Networks that discusses the fundamentals of the area, including the structure of the internet and the basics of internet communication.
- **Responsibilities:** Curriculum development, developing assignment and exam materials, organizing tutorials, grading student work.

Technical Skills

Software Engineering

- **Languages:** Python, C, C++, Bash/Shell scripting
- **Technologies:** Linux networking, NS-3, Mininet, KVM/VirtualBox, DPDK, Git, Docker, LaTeX

Data Analysis Tools

Jupyter Notebook, Pandas, Scapy, Numpy, scikit-learn, Zeek/Bro, tcpdump, Wireshark

Network Protocols

TCP/UDP, QUIC, HTTP, IPv4/IPv6, DNS, TSL/SSL

Areas of Expertise

Transport Protocols, Congestion Control, Network Measurements, Network Data Analysis, System Design, Software Implementation and Debugging, Research-based Development

Honors & Awards

2024	Best Paper Award , Passive and Active Measurement Conference (PAM)	Illinois, USA
2018	Best Masters Thesis , Tokyo University of Information Sciences Graduate Excellence Award	Chiba, Japan
2017	Best Event Paper for Wireless Sensor Networks , Federated Conference on Computer Science and Information Systems (FedCSIS)	Prague, Czech Republic
2015	ABE Initiative Scholarship , Japan International Cooperation Agency (JICA)	Chiba, Japan
2010	Best Student in Statistical Quality Control , University of Namibia	Windhoek, Namibia
2006	Undergraduate Bursary recipient , Telecom Namibia	Windhoek, Namibia

(co)Advised Students

Taha Murtaza Gain

Saarland University

MASTERS STUDENT

Jun. 2024 - ongoing

- Main subject: Congestion control
- Title: Enhancing BBR with network-assisted congestion feedback

Shuya Hashimoto

Tokyo University of Information Sciences

UNDERGRADUATE STUDENT

Mar. 2016 - Mar. 2017

- Main subject: Distributed Processing
- Title: Evaluation of Task Clustering Algorithm by FFT for Heterogeneous Distributed System

Taro Iwabuchi

Tokyo University of Information Sciences

UNDERGRADUATE STUDENT

Mar. 2016 - Mar. 2017

- Main subject: Wireless Networks
- Title: Asymmetric RTS/CTS Scheme in IEEE 802.11 networks

Jovita N. Mateus

Namibia University of Science and Technology

HONOURS DEGREE STUDENT

Feb. 2015 - Dec. 2015

- Main subject: Multimedia Wireless Networks
- Title: Evaluation of Video Streaming Quality over Wireless IP Networks

Presentations

Passive and Active Measurement Conference (PAM)

Online, USA

PRESENTER FOR "PROMISES AND POTENTIAL OF BBRv3"

Mar. 2024

- Presented our research paper that investigated the potential impact of the new BBRv3 deployment in the Internet.

Federated Conference on Computer Science and Information Systems (FedCSIS)

Prague, Czech Republic

PRESENTER FOR "OPTIMIZING RTS/CTS TO IMPROVE THROUGHPUT IN AD HOC WLANS"

2017

- Presented our research paper that implemented an optimized RTS/CTS scheme for IEEE 802.11 wireless networks.

International Conference on Advanced Communication Technology (ICACT)

PyeongChang, South Korea

PRESENTER FOR "AD HOC WLAN THROUGHPUT IMPROVEMENT BY REDUCTION OF RTS RANGE"

2017

- Presented our research paper that implemented an exposed node reduction for IEEE 802.11 wireless networks.

Institute of Electronics, Information and Communication Engineers (IEICE) General Conference

Nagoya, Japan

PRESENTER FOR "PERFORMANCE IMPROVEMENT OF IEEE 802.11 RTS/CTS SCHEME BY EXPOSED NODE REDUCTION"

2017

- Presented our research results for an exposed node reduction scheme for IEEE 802.11 wireless networks.

Southern Africa Telecommunication Networks and Applications Conference (SATNAC)

George, South Africa

PRESENTER FOR "ASYMMETRIC RTS/CTS FOR EXPOSED NODE REDUCTION"

2016

- Presented a short paper with preliminary results on research for reducing exposed nodes in IEEE 802.11 wireless networks.

PRE-REVIEW COMMITTEE
USENIX NSDI, '25
USENIX NSDI, '25

Fall Deadline
Spring Deadline

(CO)REVIEWER
ACSAC, '24

International

TECHNICAL PROGRAM COMMITTEE - STUDENT SCRIBE
ACM CoNEXT, '20

International

PARTICIPATION IN EVENTS

Online IETF 120 Meeting, '24
Online PAM, '21 '22 '23 '24
Online IETF 116 Meeting, '24
Online ACM Sigcomm, '21
Online ACM IMC, '21
Online ACM HotNets, '21
In-Person ACM IMC, '19
In-Person QUIC Symposium, '19
In-Person FedCSIS, '17
In-Person IEICE General Conference, '17
In-Person ICACT, '17
In-Person SATNAC, '16

Vancouver, Canada
International
Yokohama, Japan
International
International
International
Amsterdam, NL
Diepenbeek, BE
Prague, CR
Nagoya, Japan
PyeongChang, S.
Korea
George, ZA