Kevin Vermeulen
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CNRS researcher

RESEARCH INTERESTS

Networks and networks measurements. Building measurement systems and techniques for a better Internet.

EDUCATION

2017 – 2020
Doctorate in Computer Science, “Improved Algorithms for capturing Internet maps’’, supervised by Olivier Fourmaux and Timur Friedman, Sorbonne Université, Paris, France

2012 - 2016
MSc in Engineering, specialization in Computer Science, Institut Mines-Telecom Atlantique *grande école*, Brest, France

2010 - 2012
Prépa maths sup' et maths spé (non-degree **Bachelor**'s level program), intensive advanced mathematics studies for entry into the *grandes écoles*, Lycée Henri IV, Paris, France

2009 - 2010
Baccalaureate (French national diploma), scientific option, with honors, Lycée Baudelaire, Roubaix, France

EMPLOYMENT

October 2021 – Current
CNRS Researcher (tenured position), LIX, Ecole Polytechnique, Palaiseau, France

October 2021 – March 2025
CNRS Researcher (tenured position), LAAS-CNRS, Toulouse, France

October 2020 – October 2021
Postdoctoral researcher with professor Ethan Katz-Bassett, Columbia University, New York, NY, USA

Septembre 2017 – Septembre 2020
Research assistant with Professor Timur Friedman, Sorbonne Université, Paris, France

July 2019 - September 2019
Visiting research scholar with professor Robert Beverly and Justin P. Rohrer, Naval Postgraduate School (NPS), Monterey, CA, USA

September 2016 - August 2017
Software database engineer, Murex (leading company in fintech), Paris, France

March 2016 – September 2016
Software database engineer intern, French Ministry of Armies, Paris, France

PUBLICATIONS

Note: In my domain of research on Internet measurements, the ACM Internet Measurement Conference (IMC) is the leading venue, with acceptance rates of around 25%. The PAM and TMA conferences are the other venues for Internet measurements, with higher acceptance rates. In the more general field of computer networks, the USENIX NSDI , ACM SIGCOMM, and ACM CoNEXT conferences are the leading venues with acceptance rates of around 20%. The ACM HotNets is the leading workshop for hot topics and new or controversial ideas in computer networks, with acceptance rates around 30%. IMC, SIGCOMM, and NSDI are classified as top conferences in their domain by the https://csrankings.org/ website, which gives the top conferences of different domains of computer science according to researchers of the fields.

These conferences and workshops are the best places to publish my work, although journals with excellent reputations exist, such as IEEE/ACM Transactions of Networking and ACM SIGCOMM Computer Communication Review. Following the preferences of my research community, I tend to prefer publishing in the top conferences of my domain, that are as prestigious as the journals cited above and better for dissemination. Recently, CoNEXT publishes the long papers accepted at the conference in a journal, Proceedings of the ACM of Networking (PACMNET), so my CoNEXT long papers can be considered as journal publications.

I am also attached to replicability, reproducibility, and open science, and unless there are proprietary reasons, I always publish the code and the data that I collect during my research and make them available to the community. Until now, I have always submitted my artifacts for evaluation when the call for papers was proposing to do so. Moreover, the section Software production describes how I contribute to producing data for the community.

Refereed conference publications

- **Detecting Traffic Engineering from Public BGP Data**
  Omar Darwich**,** Cristel Pelsser**, Kevin Vermeulen**.
  PAM 2025
  Acceptance rate**:** 30%

- **metAScritic: Reframing AS-Level Topology Discovery as a Recommendation System**
  Loqman Salamatian, **Kevin Vermeulen**, Italo Cunha, Vasilis Giotsas, Ethan Katz-Bassett
  ACM IMC 2024
  Acceptance rate: 21% (18% for long papers)

- **Geofeeds: Revolutionizing IP Geolocation or Illusionary Promises?**
  Ioana Livadariu*, **Kevin Vermeulen***, Maxime Mouchet, Vasilis Giotsas
  ***equal contribution**
  ACM CoNEXT 2024
  Acceptance rate: 12% (Winter session)

- **A First Look At IPv6 Hypergiant Infrastructure**
  Fahad Hilal, Patrick Sattler, **Kevin Vermeulen**, Oliver Gasser
  ACM CoNEXT 2024
  Acceptance rate: 12% (Winter session)
  Artifact evaluation: Three ACM badges on reproducibility

- **An explainable-by-design ensemble learning system to detect unknown network attacks**
  Céline Minh, **Kevin Vermeulen**, Cédric Lefebvre, Philippe Owezarski, William Ritchie
  IEEE/IFIP CNSM 2023
  Acceptance rate**:** 19%

- **Replication: Towards a Publicly Available Internet Scale IP Geolocation Dataset**
  Omar Darwich, Hugo Rimlinger, Milo Dreyfus, Matthieu Gouel, **Kevin Vermeulen**.
  ACM IMC 2023
  Acceptance rate**:** 25%
  Awarded best artifact award

- **RPKI Time-of-Flight: Tracking Delays in the Management, Control, and Data Planes**
  Romain Fontugne, Amreesh Phokeet, Cristel Pellser, **Kevin Vermeulen**, Randy Bush
  PAM 2023
  Acceptance rate**:** 34%

- **Internet Scale Reverse Traceroute**
  Kevin Vermeulen, Ege Gurmericliler, Italo Cunha, David Choffnes, Ethan Katz-Bassett.
  ACM IMC 2022
  Acceptance rate**:** 26%

- **The Best of Both Worlds: High Availability CDN Routing Without Compromising Control**
  Jiangchen Zhu, **Kevin Vermeulen,** Italo Cunha, Ethan Katz-Bassett, Matt Calder.
  ACM IMC 2022
  Acceptance rate**:** 26%
  Awarded best short paper

- **IP Geolocation Database Stability and Implications for Network Research**
  Matthieu Gouel, **Kevin Vermeulen**, Olivier Fourmaux, Timur Friedman, Robert Beverly.
  IEEE/IFIP TMA 2021
  Acceptance rate**:** 43%

- **Alias Resolution Base on ICMP Rate Limiting**
  Kevin Vermeulen, Burim Ljuma, Vamsi Addanki, Olivier Fourmaux, Timur Friedman, Reza Rejaie.
  PAM 2020
  Acceptance rate**:** 29%

- **Diamond-Miner: Comprehensive Discovery of the Internet's Topology Diamonds**
  Kevin Vermeulen, Justin P. Rohrer, Robert Beverly, Olivier Fourmaux, Timur Friedman.
  USENIX NSDI 2020
  Acceptance rate**:** 17%

- **Multilevel MDA-Lite Paris Traceroute**
  Kevin Vermeulen, Stephen D. Strowes, Olivier Fourmaux, Timur Friedman.
  ACM IMC 2018
  Acceptance rate**:** 25%
  Artifact evaluation: Three ACM badges on reproducibility

Refereed journal publications

- **Geofeeds: Revolutionizing IP Geolocation or Illusionary Promises?**
  Ioana Livadariu*, **Kevin Vermeulen***, Maxime Mouchet, Vasilis Giotsas
  ***equal contribution**
  PACMNET 2024 (CoNEXT journal)

- **A First Look At IPv6 Hypergiant Infrastructure**
  Fahad Hilal, Patrick Sattler, **Kevin Vermeulen**, Oliver Gasser
  PACMNET 2024 (CoNEXT journal)

- **Zeph & Iris map the Internet: A Resilient Reinforcement Learning Approach to Distributed IP Route Tracing**
  Matthieu Gouel, **Kevin Vermeulen**, Maxime Mouchet, Justin P. Rohrer, Olivier Fourmaux, Timur Friedman.
  ACM SIGCOMM CCR, January 2022

Refereed workshop publications

- **The Central Problem with Distributed Content**
  Kevin Vermeulen, Loqman Salamatian, Sang Hoon Kim, Matt Calder, Ethan Katz-Bassett.
  ACM HotNets 2023
  Acceptance rate**:** 27%

- **Towards a Traffic Map of the Internet**
  Tom Koch, Weifan Jiang, Tao Luo, Petros Gigis, Yunfan Zhang**, Kevin Vermeulen**, Emile Aben, Matt Calder, Ethan Katz-Bassett, Lefteris Manassakis, Georgios Smaragdakis, Narseo Vallina-Rodriguez.
  ACM HotNets 2021
  Acceptance rate**:** 31%

- **Internet Measurements on EdgeNet**
  Demo and extended abstract.
  Kevin Vermeulen, Burim Ljuma, Olivier Fourmaux, Timur Friedman.
  IEEE INFOCOM CNERT Workshop 2019.

Refereed national conference publications

- **GeoGiant: Vers une géolocalisation d'adresses IP à l'échelle grâce aux géants d'Internet**
  Hugo Rimlinger, **Kevin Vermeulen**, Olivier Fourmaux, Timur Friedman.
  AIgotel/CoRES 2024
  Awarded best student paper

AWARDS

- Best short paper award (IMC 2022)
- Best artifact award (IMC 2023)
- Best student paper award (Cores 2024)
- ISOC Pulse mentor fellowship (10k$ grant).

STUDENTS

Ph.D. students

- Omar Darwich (LAAS-CNRS): started in October 2022 (French MITT doctoral school grant), co-advised with Philippe Owezarski
  - Awarded a JSPS grant starting in October 2024

- Hugo Rimlinger (Sorbonne Université): started in October 2023 (French Ministry for the Armed Forces grant), co-advised with Timur Friedman and Olivier Fourmaux

- Fahad Hilal (Max Planck Institute for Informatics)
  - Awarded a SALTO grant (March 2024 – June 2024)
- Ufuk Bombar (Sorbonne Université): starting in October 2024 (French EDITE doctoral school grant), co-advised with Timur Friedman and Olivier Fourmaux

Master students

- Milo Dreyfus (IMT Atlantique): 2-month Internship
- William Gravil (Université Paris-Saclay): 4-month Internship

TEACHING

- Digital culture, undergraduate program, Sciences Po Paris
  Fall 2024

- Internet measurements course, Master's degree program, Sorbonne Université
  Fall 2017, Fall 2018, Fall 2019, Fall 2022, Fall 2023

- C++ programming, Master's degree program, course, lab creation and supervision, Sorbonne Université
  Fall 2019

- Programming project, undergraduate program, lab supervision, Sorbonne Université
  Spring 2019

- Java programming, undergraduate program, lab supervision, Sorbonne Université
  Spring 2018

SERVICE

Technical Program Committee Member:

- ACM IMC (2023, 2024, 2025)
- ACM SIGMETRICS (2023, 2025)
- PAM (2022, 2024, 2025)
- IFIP/IEEE TMA (2024)

External Reviewer

- ACM SIGMETRICS (2024)
- Transactions on Networking (2022)
- ACM IMC (2019)

- IEEE INFOCOM CNERT Workshop (2019)

SOFTWARE PRODUCTION

I attach a particular importance to share the code and the data collected during my research to enable replicability and reproducibility, which have been recognized by my community with artifact evaluation badges and artifact award. In addition to these objectives, I actively participate in the development and the maintenance of long-running measurement systems for the community.

Diamond-Miner: The Diamond-Miner system runs on the Iris platform (https://iris.dioptra.io) and has been running Internet topology multipath measurements for multiple years now, and the data have been used by multiple papers. The code has been refactored since by Matthieu Gouel and Maxime Mouchet and is available on github (https://github.com/dioptra-io). The dioptra group at Sorbonne Université are the current maintainers of the system. Also, although I am not involved in that project, a new implementation of the Diamond-Miner algorithm is currently tested to replace the scamper implementation of multipath tracing on the M-Lab traceroutes following each NDT speedtest (https://www.measurementlab.net/blog/jun24-community-call/#testing-fast-mda-traceroute).

Internet Scale Reverse Traceroute: The Internet Scale Reverse Traceroute system has different components, which are deployed at Northeastern University for the controller and the M-Lab platform for the distributed vantage points (https://www.measurementlab.net), which is sponsored by Google. The platform is open to operators and researchers, and has served for different research projects. It has also enabled an internship at Google for a PhD student at Columbia University to evaluate the benefit of Reverse Traceroute for helping Google at troubleshooting problems.

Moreover, we have deployed a “revtr-sidecar”, which performs reverse path measurement for a fraction (25%) of the M-Lab NDT speedtests (>1M reverse path measurements per day). The data are available to the community on the M-Lab Big Query, which can be accessed on this link ((https://console.cloud.google.com/bigquery?project=measurement-lab&ws=!1m4!1m3!3m2!1smeasurement-lab!2srevtr_raw). You may need an (free) M-Lab account to access the data (https://www.measurementlab.net/data/docs/bq/quickstart/). I am the current maintainer of the Internet Scale Reverse Traceroute system.

LANGUAGES

French: native speaker. English: fluent. German: working knowledge.

ACTIVITIES AND INTERESTS

Sports: club-level soccer player, former club-level basketball player
Music: former violinist and gold medalist in music theory, Music Conservatory of Roubaix, France