Vinod Vijay Nigade

Postdoctoral Researcher at Vrije Universiteit Amsterdam

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🌐 https://vnigade.github.io

Research Interests

I have around thirteen years of research and development experience in computer systems, including machine learning systems, systems for video analytics, data storage, and distributed systems. My current research focus is on developing *efficient* [*networked*] *systems* for machine learning (ML) [inference]. During my PhD, I worked on designing an inference serving system for latency-sensitive video analytics applications by leveraging the strengths of various modern computing platforms, spanning end devices, the edge, and the cloud.

Professional Experience

2023 – · · · ·   **Postdoctoral Researcher**
Vrije Universiteit Amsterdam, The Netherlands
Working in the HPDC group of the Computer Systems section.

2017 – 2018   **Principal Software Engineer**
Izel Technologies, Pune, India
Worked on a minimum viable product for source code analysis and code completion.

2017 – 2017   **Software Engineer**
WEBB Traders, Amsterdam, The Netherlands
C++ developer for developing the proprietary trading system.

2015 – 2015   **Research Assistant**
CNCR, Vrije Universiteit Amsterdam, The Netherlands
Wrote software to control the internally designed hardware to study rodent behavior.

2011 – 2014   **Software Engineer**
Symantec Corporation (now Veritas), Pune, India
Worked on veritas volume manager (VxVM), specifically on veritas volume replicator.

Education

2018 – 2023   **Ph.D. in Computer Science**
Vrije Universiteit Amsterdam, Amsterdam, The Netherlands
Thesis title: *Latency-Critical Inference Serving for Deep Learning*
Advisors: prof. Henri Bal and prof. Lin Wang

2014 – 2016   **M.Sc. *cum laude* in Parallel and Distributed Computer System**
Vrije Universiteit Amsterdam, Amsterdam, The Netherlands
Thesis title: *Efficiently Detecting Use-After-Free Exploits in Multi-Threaded Applications*
Advisors: dr. Cristiano Giuffrida and dr. Erik van der Kouwe

2007 – 2011   **B.Tech. in Computer Science and Engineering**
Walchand College of Engineering, Sangli, India
Thesis title: *Enhanced Implementation of Evolutionary Optimization Service Times in IVRS*
Advisors: dr. B. F. Momin

Publications & Patents

Conference Proceedings

1   G. H. Apostolo, P. Bauszat, **V. Nigade**, H. E. Bal, and L. Wang, "Live video analytics as a service," in *ACM European Workshop on Machine Learning and Systems (ACM EuroSys EuroMLSys)*, 2022, pp. 37–44.

② **V. Nigade**, P. Bauszat, H. Bal, and L. Wang, "Jellyfish: Timely inference serving for dynamic edge networks," in *IEEE Real-Time Systems Symposium (RTSS)*, 2022, pp. 277–290. 🎗 **Outstanding Paper Award**.

③ K. Razavi, G. Karlos, **V. Nigade**, M. Mühlhäuser, and L. Wang, "Distributed DNN serving in the network data plane," in *International Workshop on P4 in Europe (EuroP4)*, 2022, pp. 67–70.

④ **V. Nigade**, R. Winder, H. Bal, and L. Wang, "Better never than late: Timely edge video analytics over the air," in *ACM Conference on Embedded Networked Sensor Systems (ACM SenSys AIChallengeIoT)*, 2021, pp. 426–432.

⑤ **V. Nigade**, L. Wang, and H. Bal, "Clownfish: Edge and cloud symbiosis for video stream analytics," in *IEEE/ACM Symposium on Edge Computing (SEC)*, 2020, pp. 55–69.

⑥ E. Van Der Kouwe, **V. Nigade**, and C. Giuffrida, "Dangsan: Scalable use-after-free detection," in *ACM European Conference on Computer Systems (ACM EuroSys)*, 2017, pp. 405–419.

Journal Articles

① **V. Nigade**, P. Bauszat, H. Bal, and L. Wang, "Inference serving with end-to-end latency slos over dynamic edge networks," *Real-Time Systems*, pp. 1–52, 2024.

② R. De Haan, J. Lim, S. A. Van der Burg, A. W. Pieneman, **V. Nigade**, H. D. Mansvelder, and C. P. De Kock, "Neural representation of motor output, context and behavioral adaptation in rat medial prefrontal cortex during learned behavior," *Frontiers in Neural Circuits*, vol. 12, p. 75, 2018.

Patents

① **V. Nigade** and M. Soundalgekar, *Distributed replication in cluster environments*, US Patent 9,600,553, 2017.

Awards & Grants

Dec. 2022	🔖	**Outstanding Paper Award, IEEE RTSS**
Mar. 2022	🔖	**NVIDIA Academic Hardware Grant** Two A30 tensor core GPUs.
2014 – 2016	🔖	**VUFP Scholarship, Vrije Universiteit Amsterdam, The Netherlands** A merit scholarship for strongly motivated students.
2011 – 2014	🔖	**Seven employee awards at Symantec Corporation, Pune, India** Including innovation awards, customer-centric awards, and the best study paper award.
2007 – 2011	🔖	**Four programming and project competition awards during B.Tech.**

Open Source

Jellyfish	🔖	A Soft Real-Time Inference Serving System 🔗 https://github.com/vuhpdc/jellyfish
Clownfish	🔖	Edge and Cloud Symbiosis for Video Stream Analytics 🔗 https://github.com/vuhpdc/clownfish
DangSan	🔖	Efficiently Detecting Use-After-Free Exploits in Multi-Threaded Applications 🔗 https://github.com/vnigade/DangSan
Whisker	🔖	Software to control the operational characteristics of a behavioural apparatus 🔗 https://github.com/vnigade/Whisker

Academic Services

Technical Reviewer

Dec. 2023   ▉ IEEE/ACM UCC INTEL4EC

Apr. 2023   ▉ Digital Enablers of the Computing Continuum Systems, NWO ICT Open

Dec. 2022   ▉ IEEE/ACM UCC INTEL4EC

Thesis Supervision

Aug. 2022   ▉ Rishikumar Radhakrishnan, M.Sc. Project, Vrije Universiteit Amsterdam

Teaching

2020 – 2021   ▉ Teaching Assistant, Advanced Network Programming, Vrije Universiteit Amsterdam

Skills

Programming & Scripting Languages   ▉ C/C++, Python, Shell (Bash), Java (novice)

Frameworks & Libraries   ▉ Pytorch, Tensorflow, OpenCV, gRPC, Gstreamer

Version Control Systems   ▉ Git, CVS (a long time back)

Editors & IDEs   ▉ Vim, VS Code

References

Available on Request

[CV last modified on March 18, 2024]