

# Taran Lynn

## Linux Engineer

📞 (707) 372-3259  
✉ taranlynn0@gmail.com

Personal Site: <http://lambda-11235.github.io/>

GitHub: <https://github.com/lambda-11235/>

LinkedIn: <https://www.linkedin.com/in/taran-lynn/>

## Education

- 2019 BS in Computer Science and Engineering from U.C. Davis (GPA 3.98).
- 2022 MS in Computer Science from U.C. Davis (GPA 3.85).

## Specialty

I specialize in computer network infrastructure. My previous work has focused on researching TCP congestion control algorithms and AQM, with a focus on reducing end-to-end tail latency. Now my focus has shifted to applying these methods to cloud based networks. I have also briefly worked on optimizing HPC systems with deep learning.

## Skills

**Programming Languages** C • C++ • Python • Haskell • Scala • Java

**Experience With** Networking • TCP Congestion Control • AQM • AWS (IoT & Lambda)  
• OpenStack • Control Systems • Deep Learning • Tensorflow • PyTorch • Docker • HPC  
• Slurm

## Papers

- Taran Lynn, Dipak Ghosal, and Nathan Hanford. *Model Predictive Congestion Control for TCP Endpoints*. 2020. arXiv: 2002.09825 [cs.NI]
- Taran Lynn and Dipak Ghosal. *TCP D\*: A Low Latency First Congestion Control Algorithm*. 2020. DOI: 10.48550/ARXIV.2012.14996. URL: <https://arxiv.org/abs/2012.14996>

## Presentations

### Impact of Buffer Size on a Congestion Control Algorithm Based on Model Predictive Control

Presented at the 2019 Workshop on Buffer Sizing at Stanford, Ca.

<http://buffer-workshop.stanford.edu/papers/paper14.pdf>

<http://buffer-workshop.stanford.edu/slides/mpc.pdf>

## University Projects

### Model Predictive Congestion Control

- New TCP congestion control algorithm providing a smooth RTT signal across dedicated WANs.
- Based on concepts from model predictive control.
- Implementations developed for both the TCP congestion control and qDisc layers in the Linux kernel.

### Randomizing Malloc for Security

- Expanded on method to disrupt certain classes of buffer overflow attacks that target malloc metadata.
- Main contribution was randomizing spacing between malloc's allocated memory chunks.

## Optimizing HPC Scheduling with LSTM Networks

- Part of a graduate course on deep learning.
- Done in partnership with UC Davis' HPC Core Facilities (HPCCF).
- Used long-short term memory (LSTM) network to predict HPC job runtimes and memory usage, with the eventual goal of optimizing scheduling algorithms in high-performance computing (HPC) centers.

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## Open Source Contributions

**Idris** I wrote documentation on the `codata` keyword.

See <https://github.com/idris-lang/Idris-dev/pull/3094/>.

**NixOS** I maintain several packages in their repository.

See <https://github.com/NixOS/nixpkgs/>.

**The Secret Chronicles of Dr. M** I helped port the game from SDL to SFML.

See <https://secrechronicles.org/en/>.

**Red Eclipse** I contributed custom content to their community repository.

See <https://www.redeclipse.net/>.

## Personal Open Source Repositories

**TTyped** A dependently typed language directly based off of Coquand's Calculus of Constructions.

**debtTools** A command line python program to help users track and calculate payments for compound interest debt.

**Markov's Password** A random password generator based off of the XKCD comic "Password Strength" (<https://www.xkcd.com/936/>).

**FarRP** A library for functional reactive programming that leverages dependent types in the Idris.

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## Awards

- Received 2019 U.C. Davis Computer Science Departmental Citation.

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## Fellowships and Grants

- Received the Towards Outstanding Postgraduate Students (TOPS) Award. This is an internal award provided by the College of Engineering at UC Davis.