Tikhon Jelvis

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Experience

Principal Data Scientist — Target — Oct 2019–now

- Tech lead on large-scale deep learning model for demand forecasting
  - Day-granularity forecasts for 100k SKUs x 2000 Target stores x 14 weeks (20B forecasts)
  - Trained embeddings used for similarity, clustering and training explainable forecasting models
- Developed store similarity API based on embeddings from deep learning model
  - Created first-of-a-kind item-store demand-based clustering model, used for assortment planning
- Led refactor/redesign + containerization for demand forecasting model training
- Created system requirements for new AI infrastructure across the AI teams at Target
- Mentored teams working on new-item forecast and forecast training scalability
  - Guided architecture + system design

Lead Data Scientist — Target — Jul 2016–Oct 2019

- Designed three generations of Target's multi-echelon inventory control simulation (Haskell, Rust)
  - Scaled to support sales and operations planning for ≈30% of Target's SKUs
  - Improved SKU availability across Target stores by 50bps
  - Detected supply chain defects ahead of time
  - Supported scenario planning for events like COVID or extreme weather
  - Improved runtime performance by 15–20x across generations
- Led software design for warehouse operations simulation (Python)
  - Simulated scenarios for new automation in Perth-Amboy flow center
  - Evolved into labor planning tool for 30+ Target distribution centers
- Led team to define explicit protocols between pipeline components
  - Saved hours of work each week when deploying pipelines
  - Designed interface description language to help overcome the team's initial friction: target/theta-idl (Haskell, Rust, Python)
- Taught multi-year course on functional programming and Haskell

Software Engineer — Esper — Jul 2014–Oct 2015

- Implemented OAuth, IMAP and GMail API in backend (OCaml)
- Wrote Chrome extension that injected a tool bar + sidebar into GMail UI (TypeScript)
- Prototyped Android app (Java)

Research Assistant — Berkeley Par Lab — Aug 2012–Nov 2013

- Implemented + evaluated algorithms to synthesize code for GA144 chips
- Co-author on PLDI 2014 paper

Tech Intern — Jane Street — Jun 2013–Aug 2013

- Two OCaml projects: live data visualization tool + userland automount replacement

Skills

- Languages: Haskell, Python, Rust, OCaml, Scala, Java, TypeScript, JavaScript
- Skills: Hadoop/Hive, Nix, stochastic optimization, simulation, domain-specific languages (DSLs)

Publications

- *Foundations of Reinforcement Learning* (TikhonJelvis/rl-book) — CRC Press, 2022–2023
  - Co-author with Ashwin Rao; used for CME 241 at Stanford
- Chlorophyll: Synthesis-Aided Compiler for Low-Power Spatial Architectures — PLDI 2014
- 5+ pending patents — 2018–2020

Projects

- 10+ conference talks 2015–now
  - Reasoning under Uncertainty Introduction to Markov decision processes (Haskell Love 2020)
  - Functional Reactive Progreamming (Scale by the Bay 2019)
  - Radix Trees (Lambda World 2018, Scale by the Bay 2018)
- Open source
  - Theta (target/theta-idl: an interface description language and serialization library for Haskell, Rust and Python
  - Didactic Python RL framework for *Foundations of Reinforcement Learning* book
  - Upstreamed fixes to Nixpkgs, the Haskell avro library and more
- Writing
  - Top 20 Haskell contributor on Stack Overflow
  - Quora Top Writer; example posts:
    * How to decided which modules to couple or decouple
    * Why I use Haskell
    * Explanation of laziness in Haskell

Community

- Director, Haskell.org 2018–now
  - Director for the 501(c)(3) that runs the Haskell website + community infrastructure
- BayHac Organizer 2017–2018
  - Organized + raised funds for three-day Haskell community conference with >100 attendees
- Bay Area Haskell Meetup Organizer 2016–2020
  - Hosted 20+ Haskell talks with 20–50 attendees

Education

BS EECS (incomplete) University of California, Berkeley 2010–2013