

# Alex Conway

PHD CANDIDATE · COMPUTER SCIENCE

397 2nd St, Apt 4, Jersey City, NJ 07302 USA

✉ conway@ajhconway.com | 🏠 www.ajhconway.com | 📱 ajhconway | 🎓 Alex Conway

## Education

### Rutgers University

NEW BRUNSWICK, NJ

PH.D. IN COMPUTER SCIENCE

SEPT. 2015 - PRESENT

- Research under advisor Prof. Martín Farach-Colton. Areas of interest include external memory algorithms and storage systems.

### Princeton University

PRINCETON, NJ

M.S. IN MATHEMATICS

SEPT. 2007 - MAY 2011

### Rutgers University

NEW BRUNSWICK, NJ

B.S. IN MATHEMATICS

SEPT. 2003 - MAY 2007

## Publications

### CONFERENCE PAPERS

#### SplinterDB: Closing the Bandwidth Gap for NVMe Key-Value Stores

ATC

A. CONWAY, A. GUPTA, V. CHIDAMBARAM, M. FARACH-COLTON, R. SPILLANE, A. TAI, R. JOHNSON

2020

#### How to Copy Files

FAST

Y. ZHAN, A. CONWAY, I. GROOMBRIDGE, Y. JIAO, N. MUKHERJEE, M. BENDER, M. FARACH-COLTON, W. JANNEN, R. JOHNSON, D. PORTER, J. YUAN

2020

#### Filesystem Aging: It's more Usage than Fullness

HOTSTORAGE

A. CONWAY, E. KNORR, Y. JIAO, M. BENDER, W. JANNEN, R. JOHNSON, D. PORTER, M. FARACH-COLTON

2019

#### Small Refinements to the DAM Can Have Big Consequences for Data-Structure Design

SPAA

M. BENDER, A. CONWAY, M. FARACH-COLTON, W. JANNEN, Y. JIAO, R. JOHNSON, E. KNORR, S. McALLISTER, N. MUKHERJEE, P. PANDEY, D. PORTER, J., Y. ZHAN

2019

#### Optimal Ball Recycling

SODA

M. BENDER, J. CHRISTENSEN, A. CONWAY, M. FARACH-COLTON, R. JOHNSON, M. TSAI

2019

#### Optimal Hashing in External Memory

ICALP

A. CONWAY, M. FARACH-COLTON, P. SHILANE

2018

#### The Full Path to Full-Path Indexing

FAST

Y. ZHAN, Y. JIAO, A. CONWAY, E. KNORR, M. BENDER, M. FARACH-COLTON, B. JANNEN, D. PORTER, J. YUAN, R. JOHNSON

2018

#### File Systems Fated for Senescence? Nonsense, Says Science!

FAST

A. CONWAY, A. BAKSHI, Y. JIAO, Y. ZHAN, M. BENDER, W. JANNEN, R. JOHNSON, B. KUSZMAUL, D. PORTER, J. YUAN, M. FARACH-COLTON

2017

#### The I/O Complexity of Computing Prime Tables

LATIN

M. BENDER, R. CHOWDHURY, A. CONWAY, M. FARACH-COLTON, P. GANAPATHI, R. JOHNSON, S. MCCAULEY, B. SIMON, S. SINGH

2016

### JOURNAL PAPERS

## Efficient Directory Mutations in a Full-Path-Indexed File System

TOS

Y. ZHAN, Y. JIAO, D. PORTER, **A. CONWAY**, E. KNORR, M. FARACH-COLTON, M. BENDER, J. YUAN,  
W. JANNEN, R. JOHNSON

2018

## ARTICLES

### How to Fragment Your File System

;LOGIN:

**A. CONWAY**, A. BAKSHI, Y. JIAO, Y. ZHAN, M. BENDER, W. JANNEN, R. JOHNSON, B. KUSZMAUL,  
D. PORTER, J. YUAN, M. FARACH-COLTON

2017

## Experience

### VMware Research Group

PALO ALTO, CA

RESEARCHER

JUN. 2020 - PRESENT

- Leads the SplinterDB project. SplinterDB is a general purpose key-value store built using a new data structure, the size-tiered -tree. SplinterDB is designed for outstanding performance on NVMe and other fast storage hardware, under tough conditions, such as strict memory limits, small key-value pairs and limits on CPU utilization.
- Research into key-value stores, file systems, filters, systems designed for persistent memory and other fast storage, data structures, and memory management.

### VMware Research Group

PALO ALTO, CA

RESEARCH INTERN

JUN. 2018 - JUN. 2020

- Research project with Ittai Abraham, Vijay Chidambaram, Martin Farach-Colton, Rob Johnson and Amy Tai, in collaboration with product groups.
- Designed and implemented SplinterDB, a highly concurrent NVME-optimized key-value store.
- Uses size-tiered  $B^{\infty}$ -trees, and the theory of optimal external memory hash tables to achieve theoretic optimality.

### Dell EMC

PRINCETON, NJ

RESEARCH INTERN

MAY 2017 - SEP. 2017

- Research project with Philip Shilane.
- Built a high-performance fingerprint index for deduplicated storage using BOA hash tables, a novel data structure.
- Benchmarks show improvement on the insertion performance over standard LSM-tree-based hash tables, such as the one in use in Dell EMC's Datadomain deduplication system, by a factor of 2-10x.

## Talks

### CONFERENCE TALKS

#### SplinterDB: Closing the Bandwidth Gap for NVMe Key-Value Stores

BOSTON, MA

ATC

JULY 2020

#### How to Copy Files

SANTA CLARA, CA

FAST

FEBRUARY 2020

#### Filesystem Aging: It's more Usage than Fullness

RENTON, WA

HOTSTORAGE

JULY 2019

#### Optimal Ball Recycling

SAN DIEGO, CA

SODA

JANUARY 2019

#### Optimal Hashing in External Memory

PRAGUE, CZ

ICALP

AUGUST 2018

#### File Systems Fated for Senescence? Nonsense, Says Science!

SANTA CLARA, CA

FAST

FEBRUARY 2017

Program Committee Memberships

---

ALENEX

ALEXANDRIA, VA

JANUARY 2021