Jin Shang

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EDUCATION

Carnegie Mellon University - School of Computer Science Pittsburgh, PA

Master of Science in Computer Science, 4.05/4.00 Aug 2019 - Dec 2020

- **Selected Courses**: Advanced Deep Learning (A+), Graduate Algorithms (A+), Intro to Computer Systems, Distributed System, Database System, Machine Learning for PhD.
- Teaching Assistant for Distributed Systems F20.

New York University Abu Dhabi Abu Dhabi, UAE

Bachelor of Science in Mathematics and Computer Science, 3.897/4.00 Aug 2015 - May 2019

- **Selected Courses**: Algorithm, Computer Networks, Computer Security, Data Structure, Math Modeling, Numerical Methods, Operating Systems, Software Engineering, Statistics, Theory of Computation

INTERNSHIP EXPERIENCE

Google Sunnyvale, CA (remote)

Software Engineering Intern, Cloud AI Platform Feature Store May 2020 - Aug 2020

- Worked on Feature Store, a managed cloud service for Machine Learning teams to build, share and serve features at scale.
- Designed and implemented Feature Store's Batch Serving functionality, enabling serving large amounts of historical feature values for many entitites at high throughput, typically used for generating training data for Machine Learning models.
- Wrote comprehensive unit and e2e tests for Feature Store Batch Serving that covers multiple feature and entity types.
- Wrote a Python demo notebook and presented the end-to-end workflow of Feature Store to external and internal customers.

Tencent Shenzhen, China

Software Engineering Intern, WeChat Data Center June 2019 - Aug 2019

- Developed a real-time recommendation algorithm for WeChat Moments based on FTRL-Proximal online learning algorithm with C++; tested with WeChat's SvrKit RPC framework with 5ms training time per post and 97.4% accuracy.
- Designed and implemented a feature engineering toolkit package with Scala for Apache Flink that facilitates feature selection, concatenation, labeling and formatting, compatible with all major data formats supported by Apache Flink.

PROJECTS

GoRaft: Raft Consensus Algorithm in Go CMU | Oct 2019 - Nov 2019

- Implemented Raft, a distributed consensus algorithm with leader election and log replication with RPC calls in Go.

Distributed BitCoin Miner CMU | Sep 2019 - Oct 2019

- Developing Live Sequence Protocol (LSP) in Go, a transport protocol that provides reliable client-server communication.
- Implementing a scalable distributed BitCoin miner system with LSP, enabling collaboration between unlimited coin miners.

RESEARCH EXPERIENCE

Computer Aided Study of Abstract Algebraic Structures NYUAD | Sep 2017 - May 2019

- Designed an $O(n^2)$ algorithm for computing roots and homology of nilpotent Lie algebra with Mathematica and SuperLie.
- Computed for the first time Duflo-Serganova functors and double extensions of several Lie algebras with the new algorithm.

Cognitive Transmission Mechanism for Wireless IoT Sensors NYU | June 2018 - Aug 2018

- Designed an optimal mechanism of transmission for micro IoT devices with limited battery using dynamic programming.
- Tested proposed optimal algorithm which reduces power consumption by over 50% while gaining 3 times more utility.

SELECTED PAPERS

Sofiane Bouarroudj, Dimitry Leites, **Jin Shang**. "Computer-aided study of double extensions of restricted Lie superalgebras preserving the non-degenerate closed 2-forms in characteristic 2", *Experimental Mathematics, 1-13, 1(2019).*

Sofiane Bouarroudj, Dimitry Leites, Alexander Lozhechnyk, **Jin Shang**. "The roots of exceptional modular Lie superalgebras with Cartan matrix", *Arnold Mathematical Journal, 63-118, 6(2020).*

Jin Shang, Muhammad Junaid Farooq, Quanyan Zhu. "Real-Time Transmission Mechanism Design for Wireless IoT Sensors with Energy Harvesting under Power Saving Mode", arxiv: 1812.02615

SKILLS

Programming Languages: *C/C++, Python, Java, GoLang, SQL, Mathematica, Scala*

Libraries and Tools: *C++ STL, Git, Numpy, Matplotlib, Apache Flink, Google Internal Tools (Blaze, CitC, Guitar, …)*

尚晋

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教育背景

卡耐基梅隆大学 - 计算机科学院，CMU School of Computer Science 匹兹堡, 美国

计算机科学硕士，*4.05/4.00* 2019 年 8 月-2020 年 12 月

- **部分所选课程**: 高级深度学习（A+），高级算法（A+），分布式系统, 数据库系统, 编译器设计，机器学习导论（博士），理论计算机科学导论（博士），自动推理与可满足性检查（博士），密码学导论（博士）
- 2020 秋季学期分布式系统教学助理

纽约大学阿布扎比分校，NYU Abu Dhabi 阿布扎比，阿联酋

数学与计算机科学学士，*3.897/4.00* 2015 年 8 月 - 2019 年 5 月

- **部分所选课程**: 数据结构，算法，计算机系统结构，计算机网络，操作系统，软件工程，数学建模，数值方法，抽象代数 I&II，数学分析 I&II，微分方程
- **研究方向**：超对称李代数与计算机代数系统，师从 Dimitry Leites 与 Sofiane Bouarroudj

实习经历

谷歌 湾区，美国

实习软件开发工程师，谷歌云 *AI* 平台 2020 年 5 月-2020 年 8 月

- 参与了谷歌云 AI 平台的特征存储服务的设计与开发。特征存储是为机器学习团队实现规模化构造、分享与输出特征的云服务。
- 设计并实现了特征存储的批量输出服务，旨在以高吞吐量一次性输出大批量历史特征数据，可直接用于训练机器学习模型。
- 为特征存储批量输出编写了全面的单元测试与端到端测试，覆盖多种特征种类与实体类型的拼接并实现了用户请求验证。
- 编写了特征存储的实例 Jupyter Notebook，向谷歌内部与外部客户团队展示了特征存储在机器学习工作流的强大作用。

腾讯 深圳, 中国

实习软件开发工程师，微信数据中心 2019 年 6 月-2019 年 8 月

- 使用 FTRL 在线学习算法实现了实时推荐系统，并使用微信 PHXRPC 框架进行模拟测试。达到 5ms 延迟与 97.7% 准确率。
- 设计并开发了为腾讯 Oceanus 平台（基于 Apache Flink）的特征工程工具，可以实现特征选取、拼接和重命名。该工具被使用到微信游戏推荐系统，其生成的基于用户数据、好友数据与好友关系数据的综合特征向量，可直接被用于训练推荐模型。

项目经历

GoRaft: 用 Go 语言实现 Raft 一致性算法 CMU | 2019 年 10 月-2019 年 11 月

- 在 Go 语言中使用 RPC 服务实现了 Raft 算法，一个通过领袖选举和日志复制实现一致性的分布式算法。

分布式比特币挖矿系统 CMU | 2019 年 9 月-2019 年 10 月

- 使用 Go 语言实现了存活序列协议（LSP），一个基于 UDP 的保证客户端-服务器可靠通讯的传输层协议。
- 使用 LSP 实现了可规模化比特币挖矿系统，允许不限数量的挖矿机互相合作且保证负载均衡。

研究经历

使用计算机代数系统研究复杂李超代数结构 NYUAD | Sep 2017 - May 2019

- 设计了复杂度 $O(n^2)$ 的算法，可用于在 Mathematica 中使用 SuperLie 库计算高维李代数的根和同调。
- 使用新算法首次计算了多个李超代数的 Duflo-Serganova 函子和双重延拓。成果已发表为多篇论文。

无线物联网传感器的可感知性传输机制 NYU | June 2018 - Aug 2018

- 使用动态规划方法为微型物联网传感器的设计了最优化传输算法，可以在减少 50% 电量损耗的情况加增加 3 倍传输效用。

部分论文

（注：纯数学领域论文并无几作之分，作者按照姓氏首字母排序）

Sofiane Bouarroudj, Dimitry Leites, **Jin Shang**. "Computer-aided study of double extensions of restricted Lie superalgebras preserving the non-degenerate closed 2-forms in characteristic 2", *Experimental Mathematics, 1-13, 1(2019).*

Sofiane Bouarroudj, Dimitry Leites, Alexander Lozhechnyk, **Jin Shang**. "The roots of exceptional modular Lie superalgebras with Cartan matrix", *Arnold Mathematical Journal, 63-118, 6(2020).*

Jin Shang, Muhammad Junaid Farooq, Quanyan Zhu. "Real-Time Transmission Mechanism Design for Wireless IoT Sensors with Energy Harvesting under Power Saving Mode", arxiv: 1812.02615

技能

编程语言: *C/C++, Python, Java, GoLang, SQL, Mathematica, Scala*

库与工具链: *C++ STL, Git, Numpy, Matplotlib, JUnit4,* 谷歌内部工具链 *(Blaze, CitC, Guitar, ...)*