

CONTACT INFORMATION  
 Tel: +86-13305014345  
 Tel: +65-89420214  
 ✉ E-mail: chenhan@u.nus.edu  
 Github: [www.github.com/Concyclics](https://www.github.com/Concyclics)  
 Address: 09-01, West Coast Residential Village, 127371, Singapore



EDUCATION  
**National University of Singapore**, Singapore. 2023–2025(Expected)  
 ◦ Master of Computing, Computer Science Specialization. GPA: 4.38/5.0  
**South China University of Technology (SCUT)**, Guangzhou, China. 2019–2023  
 ◦ B.Eng., Software Engineering. GPA: 3.61/4.0

PRIZES AND AWARDS  
 • **Excellent Degree Dissertation of South China University of Technology** 2023  
 • **Honorable Mention** in Mathematical Contest in Modeling 2023  
 • **National Scholarship** 2022  
 • **Bronze Medal (46th)** in ICPC Asia-East Continent Final(Xi An) 2022  
 • **101/1608** in CCF-DBCI Competition of "Small Sample Data Classification" 2022  
 • **Silver Medal (46th)** in ICPC Asia Regional Contest(Ji Nan) 2021  
 • **44/3567** in CCF-DBCI Competition of "Recognition of figure skaters' skeleton points based on Paddle" 2021

RESEARCH EXPERIENCE  
 • **Symmetric Matrix Solving Algorithm Parallel Optimization for ARM Architecture**  
 Mentor: Prof. Deyou TANG May-Dec. 2022  
 ◦ Optimize and parallel Bounded Bunch-Kaufman Algorithm(\*sysv\_rk subroutine of LAPACK) for solving symmetric matrix on ARM server processor with NEON instruction set and openMP.  
 ◦ Implement a parallel column reordering method in row swap of solving symmetric matrix to enhance memory access locality for column major matrix for better cache hit rate and parallelism, achieving a performance improvement from 320Gflops to 580Gflops.  
 ◦ Implement the same optimization on Skylake Intel processor and achieve 2-5x multi-core speedup than MKL library for \*sytrs.3 subroutine of LAPACK.  
 ◦ Awarded as the Excellent Degree Dissertation of South China University of Technology.  
 • **Research Assistant in Hong Kong University of Science and Technology, Guangzhou**  
 Mentor: Prof. Zeyi WEN Apr-Sept. 2023  
 ◦ Implement a library of parallel hyper graph partitioning with openMP task.  
 ◦ Realize a multiple node contraction algorithm for graph coursening.  
 ◦ Research parallel graph partitioning algorithm and adapt it for fill-in reduction of sparse matrix.  
 • **Internship in SG Digital Trust Lab, Singapore Research Center, 2012 Laboratory**  
 Mentor: Dr. Tao HUANG Jan.-now 2024  
 ◦ Research on high-performance symmetric encryption algorithm and SIMD optimization with AES instructions.  
 ◦ Optimize LOL-MINI-NMH algorithm with scroll array and XOR fusion feature of KUN-PENG 920 processor to improve the performance from 7.1Gbps to 8.5Gbps.

- Realize a new stream encryption algorithm with 49Gbps performance on KUNPENG 920 processor with the same AES instructions involved(3:1) as SOTA method Rocca which run at 38Gbps on the same processor.

---


TECHNICAL  
SKILLS

- *English*: IELTS(6.5), CET-4, CET-6.
- *Programming Languages*: C/C++, Fortran, p4-16, Python, SQL, L<sup>A</sup>T<sub>E</sub>X.
- *Technical Skills*: openMP, SIMDs(NEON, AVX512), MPI, PyTorch, CUDA.
- *TestDemo Certificate*: C++, TOP 10%, LINUX, TOP 10%, PYTHON, TOP 10%.
- *Kaggle Certificate*: Data Visualization, Intro to Machine Learning, Intro to Deep Learning, Intro to Game AI and Reinforcement Learning.

---

EXCHANGE  
EXPERIENCE

- **Online Academic Program on Machine Learning, McGill University** Jan.-Feb. 2022

联系方式	Tel: +86-13305014345	
	Tel: +65-89420214	
	✉ E-mail: chenhan@u.nus.edu	
	Github: www.github.com/Concyclics	
	地址: 新加坡 West Coast Residential Village 09-01 127371	

教育经历	新加坡国立大学, 新加坡	2023–2025(预计)
	◦ 计算机科学硕士, 计算机科学方向.	GPA: 4.38/5.0
	华南理工大学, 广东省广州市	2019–2023
	◦ 工学学士, 软件工程专业.	GPA: 3.61/4.0

获奖荣誉	● 华南理工大学本科优秀毕业设计(论文)	2023
	● 二等奖 美国大学生数学建模竞赛 (MCM/ICM)	2023
	● 铜牌 第46届ICPC国际大学生程序设计竞赛亚洲区决赛	2022
	● 101/1608 CCF-DBCI "小样本数据分类算法" 竞赛	2022
	● 国家奖学金	2022
	● 银牌 第46届ICPC国际大学生程序设计竞赛(济南站)	2021
	● 44/3567 CCF-DBCI "基于飞浆实现花样滑冰选手骨骼点识别" 竞赛	2021

项目经历	● 对称矩阵函数求解BBK算法的并行优化	2022/04–2022/12
	合作单位: 华为鲲鹏计算 导师: 汤德佑教授	
	<ul style="list-style-type: none"> <li>在ARM处理器上利用NEON指令集和openMP对Bounded Bunch-Kaufman算法(LAPACK库 *sysv_rk 函数)进行并行优化。</li> <li>实现了一种并行列重排方法, 在列优先矩阵的行交换中改进访存局部性, 使得缓存命中率和并行性能得到提高, 在鲲鹏920-6426处理器上的单精度性能从320Gflops提升到580Gflops。</li> <li>将该方法移植到Intel Skylake处理器上, 对比MKL库的*sytrs_3函数, 实现了2-5倍的并行性能提升。</li> <li>该项目获评华南理工大学本科优秀毕业设计。</li> </ul>	
● 科研助理: 香港科技大学广州校区	2023/04–2023/09	
	导师: 文泽忆教授	
	<ul style="list-style-type: none"> <li>实现了一个基于openMP Task的并行多层拓扑图分割库。</li> <li>在图压缩中实现了一种多节点收缩算法。</li> <li>研究将并行图分割算法, 应用于稀疏矩阵的填充减少。</li> </ul>	
● 实习生: 华为2012实验室新加坡研究所数字信任实验室	2024/01–至今	
	导师: 黄涛博士	
	<ul style="list-style-type: none"> <li>研究利用SIMD指令集实现的高性能的流式对称密码算法。</li> <li>通过滚动数组优化和鲲鹏920处理器的异或指令融合特性, 将LOL-MINI-NMH算法的性能从7.1Gbps提升到8.5Gbps。</li> <li>实现了一种新的对称流加密算法, 与当前SOTA算法Rocca相比, 在使用相同比例AES指令(3:1)的情况下, 在鲲鹏920处理器上达到了49Gbps的性能, Rocca算法在该处理器上性能为38Gbps。</li> </ul>	

专业技能

- 英语认证水平: CET-4, CET-6, IELTS(6.5).
- 编程语言: C/C++, Fortran, p4-16, Python, SQL, L<sup>A</sup>T<sub>E</sub>X.
- 编程技能: openMP, SIMDs(NEON, AVX512), MPI, PyTorch, CUDA.
- *TestDemo* 编程技能认证: C++, TOP 10%, LINUX, TOP 10%, PYTHON, TOP 10%
- *Kaggle* 课程认证: 数据可视化, 机器学习, 深度学习, 强化学习

---

交换经历

- 机器学习线上访学项目, 麦吉尔大学 2022/01–2022/02