

# Keyun Cheng

Department of Computer Science and Engineering  
The Chinese University of Hong Kong, Hong Kong  
Email: [kycheng@cse.cuhk.edu.hk](mailto:kycheng@cse.cuhk.edu.hk)  
Tel: (86)13378697626 (852)59336461  
Website: <https://keyuncheng.github.io>

## ABOUT

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Keyun Cheng received the B.Eng. degree in Software Engineering from Sun Yat-Sen University in 2018, the M.Sc. degree in Computer Science from The Chinese University of Hong Kong in 2019, and the Ph.D. degree in Computer Science and Engineering from The Chinese University of Hong Kong in 2025. He was a member of the Applied Distributed System Lab (ADSLab) in The Chinese University of Hong Kong, supervised by Prof. Patrick P. C. Lee. His research interests include distributed storage systems and erasure coding.

## EDUCATION

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|---|---|
| <b>The Chinese University of Hong Kong, Hong Kong</b><br><i>Ph.D. in Computer Science and Engineering</i> | Dept. of Computer Science and Engineering<br><i>Aug. 2020 - Jul. 2025</i> |
| • GPA: 3.706/4.000; Ranking: N/A  |   |
| <b>The Chinese University of Hong Kong, Hong Kong</b><br><i>M.Sc. in Computer Science</i>                 | Dept. of Computer Science and Engineering<br><i>Aug. 2018 - Nov. 2019</i> |
| • GPA: 3.80/4.00; Ranking: Top 3  |   |
| <b>Sun Yat-Sen University, Guangzhou, China</b><br><i>B.Eng. in Software Engineering</i>                  | School of Data and Computer Science<br><i>Aug. 2014 - June. 2018</i>      |
| • GPA: 3.8/4.0; Ranking: 31/122   |   |

## PUBLICATIONS

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1. **[USENIX FAST 2026]** LESS is More for I/O-Efficient Repairs in Erasure-Coded Storage.  
**Keyun Cheng\***, Guodong Li\*, Xiaolu Li, Sihuang Hu, and Patrick P. C. Lee. (\*: co-first author)  
Proceedings of the 24th USENIX Conference on File and Storage Technologies (FAST 2026), Santa Clara, CA, US, February 2026. (CCF-A)
2. **[IEEE TPDS 2025]** Toward Load-Balanced Redundancy Transitioning for Erasure-Coded Storage.  
**Keyun Cheng**, Huancheng Puyang, Xiaolu Li, Patrick P. C. Lee, Yuchong Hu, Jie Li, and Ting-Yi Wu.  
IEEE Transactions on Parallel and Distributed Systems (TPDS), 36(5), pp. 889-902, May 2025. (CCF-A)
3. **[ACM TOS 2025]** A Survey of the Past, Present, and Future of Erasure Coding for Storage Systems.  
Zhirong Shen, Yuhui Cai, **Keyun Cheng**, Patrick P. C. Lee, Xiaolu Li, Yuchong Hu, and Jiwu Shu.  
ACM Transactions on Storage (TOS), 21(1), pp. 4:1-4:39, January 2025. (CCF-A)
4. **[SRDS 2024]** Harmonizing Repair and Maintenance in LRC-Coded Storage.  
**Keyun Cheng**, Si Wu, Xiaolu Li, and Patrick P. C. Lee.  
Proceedings of the 43rd International Symposium on Reliable Distributed Systems (SRDS 2024), Charlotte, NC, USA, September 2024. (CCF-B)
5. **[USENIX FAST 2023]** ParaRC: Embracing Sub-Packetization for Repair Parallelization in MSR-Coded Storage.  
Xiaolu Li, **Keyun Cheng**, Kaicheng Tang, Patrick P. C. Lee, Yuchong Hu, Dan Feng, Jie Li, and Ting-Yi Wu.  
Proceedings of the 21st USENIX Conference on File and Storage Technologies (FAST 2023), Santa Clara, CA, US, February 2023. (CCF-A)

6. [IEEE INFOCOM 2023] Balancing Repair Bandwidth and Sub-packetization in Erasure-Coded Storage via Elastic Transformation.  
Kaicheng Tang, **Keyun Cheng**, Helen H. W. Chan, Xiaolu Li, Patrick P. C. Lee, Yuchong Hu, Jie Li, and Ting-Yi Wu.  
Proceedings of IEEE International Conference on Computer Communications (INFOCOM 2023), New York, US, May 2023. (CCF-A)
7. [IEEE TPDS 2022] Fast Predictive Repair in Erasure-Coded Storage: Analysis, Design, and Implementation.  
Xiaolu Li, **Keyun Cheng**, Zhirong Shen, and Patrick P. C. Lee  
IEEE Transactions on Parallel and Distributed Systems (TPDS), 33(12), pp. 3400-3414, December 2022.  
(An earlier version appeared in DSN 2019) (CCF-A)
8. [MICCAI 2019 (Oral)] Incorporating Temporal Prior from Motion Flow for Instrument Segmentation in Minimally Invasive Surgery Video.  
Yueming Jin, **Keyun Cheng**, Qi Dou, Pheng Ann Heng.  
Medical Image Computing and Computer Assisted Intervention (MICCAI), 2019. (CCF-B)

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## ACADEMIC ACTIVITIES

### Reviewer

*Conference/Journal*

- USENIX Conference on File and Storage Technologies (FAST) 2025, 2026
- IEEE International Symposium on Information Theory (ISIT) 2024
- ACM Transactions on Storage (TOS), IEEE Transactions on Computers (TC)

### Teaching Assistant

*The Chinese University of Hong Kong*

*September 2020 - January 2023*

- CSCI5550 Advanced File and Storage Systems (Instructor: Patrick P. C. Lee): Fall 2023
- CSCI120B Introduction to Computing Using C++ (Instructor: Yat Chiu Law and King Tim Lam): Fall 2022
- AIST3020 Introduction to Computer Systems (Instructor: Patrick P. C. Lee): Spring 2023, Spring 2022
- CSCI4180 Introduction to Cloud Computing and Storage (Instructor: Patrick P. C. Lee): Fall 2021

*Sun Yat-Sen University*

*September 2017 - June 2018*

- Probability Theory and Statistics (Instructor: Weiqi Luo): Fall 2017
- Complexity Analysis for Engineering (Instructor: Weiqi Luo): Spring 2018

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## ACADEMIC PROJECTS

### Erasure Coding for Dependable Distributed Storage at Scale

June 2019 - present

*Group member*

*CUHK (Supervisor: Patrick P. C. Lee)*

- Our research applies erasure coding as a low-cost redundancy mechanism to support large-scale dependable storage in distributed environments, with emphasis on balancing the design trade-offs between storage savings and performance efficiency in practical deployment, backed by theoretical and empirical analysis.

### Instrument Segmentation for Robotic Surgical Video

September 2018 - April 2019

*Group member*

*CUHK (Supervisor: Pheng Ann Heng)*

- Our research considers incorporating instrument motion information in deep learning models for accurate instrument segmentation in robotic surgical video. We design an attention module that infers temporal priors by propagating the prediction results of previous frames to the current frames via optical flow. We adopt an encoder-decoder pyramid segmentation framework based on UNet.

## WORK AND INTERNSHIP EXPERIENCE

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### Research and Development Engineer

*CU Coding Ltd.*

August 2019 - July 2020

*Shatin, N. T., Hong Kong*

- Focus on research and development on storage technologies, especially on nCloud (a multi-cloud storage system) and iNAS (a document management system).
- Assist system maintenance and software bug fixes.
- Assist project management and provide customer support.

### Research and Development Intern

*Guangzhou Intelligence Communications Technology Co. Ltd.*

December 2017 – April 2018

*Guangzhou, China*

- Focus on research and development on automated image annotation tools based on deep learning.
- Design an automated image annotation tool based on labellmg (an open-source image annotation project) and Mask-RCNN (a novel deep segmentation model). The image annotation tool performs object segmentation and further generates contours and labels for individual objects. The label metadata are stored locally and can be transferred through zeroc-ice (a framework for building networked applications).

### Research and Development Intern

*Bigo Technology Pte. Ltd.*

April 2017 – June 2017

*Guangzhou, China*

- Focus on research and development on crash log collection and analysis for Android applications.
- Design a crash log upload module in BigoLive (a video streaming app) Android client based on Google Breakpad (a crash-reporting system).
- Design a crash analysis system to collect and analyze crash logs generated by BigoLive Android client.
- Detect and analyze network abnormality from crash logs generated by BigoLive Android client.

## HONORS AND AWARDS

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Postgraduate Studentship, CUHK	2020 - 2025
Dean's List Scholarship, Faculty of Engineering, CUHK	2019
First Prize Winner (top 3) of Distinguished Academic Performance Scholarship, M.Sc. in CS, CUHK	2019
Second Class Scholarship, SYSU	2017
Meritorious Winner of Mathematical Contest in Modeling (MCM)	2017
First Class Scholarship, SYSU	2016
Third Prize of China Undergraduate Mathematical Contest in Modeling (CUMCM)	2016
Honorable Mention of Mathematical Contest in Modeling (MCM)	2016
Third Class Scholarship, SYSU	2015
Third Prize of ACM programming competition in SYSU	2015

## MISC

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**Programming Languages:** C, C++, Python, Java

**Github:** <https://github.com/keyuncheng>

**English Proficiency:** CET-4: 577, CET-6: 532, IELTS: 7.0 (L: 8.5 R: 7.0 W: 6.0 S: 5.5)

**Hobbies:** long-distance running, basketball, guitar