

# Li, Shumin

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## Education

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**Ph.D in Computer Science, The University of Hong Kong, Hong Kong** Sep 2018 - Oct 2022

- Thesis: *New methods for studying massive and complex biological data: from ultra-low depth sequence to high resolution structure.*
- Supervisor: Dr. Ruibang Luo, Prof. Tak-Wah Lam, Prof. Siu Ming Yiu

**M. Eng. in Computer Science, Harbin Institute of Technology, Shenzhen** Sep 2015 - Dec 2017

- Thesis: *Protein remote homology detection based on deep learning.*
- Supervisor: Prof. Bin Liu

**B. Eng in Network Engineering, Shenyang Aerospace University** Sep 2011 – Jul 2015

## Research Interest

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|---------------------------------|------------------------------|
| 1. Large-scale Genomic Analysis | 2. Spatial Transcriptomics   |
| 3. AI for Genomics              | 4. Bioinformatics Algorithms |

## Publications

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First or co-first author (†), Corresponding (\*)

1. **Li, S.†**, Yan, B.†, Li, T. K.†, Lu, J., Gu, Y., Tan, Y., ... & Luo, R.\* (2023). Ultra-low-coverage genome-wide association study—insights into gestational age using 17,844 embryo samples with preimplantation genetic testing. **Genome Medicine (JCR Q1, IF 2022: 12.3)**, 15(1), 10. (Citations: 2)

2. **Li, S.†**, Yan, B.†, Wu, B.†, Su, J., Lu, J., Lam, T. W., ... & Luo, R.\* (2023). Integrated modeling framework reveals co-regulation of transcription factors, miRNAs and lncRNAs on cardiac developmental dynamics. **Stem Cell Research & Therapy (JCR Q1, IF 2022: 7.5)**, 14(1), 247.

3. Zheng, Z.†, **Li, S.†**, Su, J.†, Leung, A. W. S., Lam, T. W., & Luo, R.\* (2022). Symphonizing pileup and full-alignment for deep learning-based long-read variant calling. **Nature Computational Science**, 2(12), 797-803. (Citations: 56)

4. **Li, S.†**, Chen, J., & Liu, B.\* (2017). Protein remote homology detection based on bidirectional long short-term memory. **BMC bioinformatics (JCR Q1, IF 2022: 3)**, 18(1), 1-8. (Citations: 68)

5. Liu, B.\*, & **Li, S.** (2018). ProtDet-CCH: protein remote homology detection by combining long short-term memory and ranking methods. **IEEE/ACM Transactions on Computational Biology and Bioinformatics (JCR Q1, IF 2022: 4.5)**, 16(4), 1203-1210. (Citations: 37)

6. Chen, J., Guo, M., **Li, S.**, & Liu, B\*. (2017). ProtDec-LTR2. 0: an improved method for protein remote homology detection by combining pseudo protein and supervised Learning to Rank. **Bioinformatics (JCR Q1, IF 2022 5.8)**, 33(21), 3473-3476. (Citations: 41)

7. Liu, B\*, Wang, S., Dong, Q., **Li, S.**, & Liu, X. (2016). Identification of DNA-binding proteins by combining auto-cross covariance transformation and ensemble learning. **IEEE transactions on nanobioscience (JCR Q1, IF 2022: 3.9)**, 15(4), 328-334. (Citations: 82)

## Working Papers

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**Li, S.<sup>†</sup>**, Ma, J.<sup>†</sup>, Zhao, T., Jia, Y., Liu, B., Luo, R.\*, & Huang, Y.\* (2023). CellContrast: Reconstructing Spatial Relationships in Single-Cell RNA Sequencing Data via Deep Contrastive Learning. bioRxiv, pp.2023-10.

Su, J.<sup>†\*</sup>, **Li, S.<sup>†</sup>**, Zheng, Z., Lam, T.W., Luo, R.\* (2023). ClusterV-Web: A User-Friendly Tool for Profiling HIV Quasispecies and Generating Drug Resistance Reports from Nanopore Long-Read Data. bioRxiv, 2023-10.

**Li, S.<sup>†\*</sup>**, Chow, F.W., Chen, L., Su, J., Ahmed, S., Luo, R.\* (2023) MirtronStructDB: A Comprehensive Database of Mirtrons with Predicted Secondary Structures.

Zheng, Y.<sup>†</sup>, Ye, S.<sup>†</sup>, **Li, S.<sup>†</sup>**, Liu, C., Luo, S., Xia, R., ... & Yang, D\*. (2022). A self-blinking DNA probe for 3D superresolution imaging of native chromatin. bioRxiv, 2022-06.

## Professional experience

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<b>Postdoctoral Fellow</b> , Lab of Dr. Ruibang Luo, HKU	Nov 2022 - Present
<b>Teaching Assistant</b> , ENGG1340/COMP2113 Computer programming II, HKU	Sep 2018 - Sep 2022
<b>Research Intern</b> , Ping An Technology	Jan 2018 - July 2018

## Presentations

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Selected Talk: "CellContrast: Reconstructing Spatial Relationships in Single-Cell RNA Sequencing Data via Deep Contrastive Learning". Joint Bioconductor Asia - Hong Kong Bioinformatics Symposium at The University of Hong Kong. Oct 17, 2023.

## Academic Services

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Reviewer for ACM-BCB

## Awards

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2018-2022	Postgraduate Scholarships, The University of Hong Kong
2018	<b>Outstanding graduate student</b> , Harbin Institute of Technology
2015 – 2017(Twice)	The first level of university scholarship, Harbin Institute of Technology
2013 – 2014	<b>Government Scholarship of Liaoning province</b>
2013 – 2014	<b>First Place</b> , The 7 <sup>th</sup> ACM-ICPC Liaoning province
2012 – 2013	<b>First Place</b> , National College Students Mathematics Contest, Liaoning province
2012 – 2013	<b>Third Place</b> , the 6 <sup>th</sup> ACM-ICPC Liaoning province