Hanlin Ren

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🌐 https://hanlin-ren.github.io/   ⬆ Last updated: Oct 2023

Education

Oct 2021 – present   🔖 **University of Oxford, UK**
DPhil in computer science
Advisor: Prof. Rahul Santhanam

Aug 2016 – Jun 2021   🔖 **Tsinghua University, China**
Bachelor of engineering
Major: computer science (Special Pilot CS Class, a.k.a Yao Class)
GPA: 3.83/4; rank: 8/38

Publications

(Note: in theoretical computer science, the list of authors are usually sorted in alphabetical order.)

🔖 **Polynomial-Time Pseudodeterministic Construction of Primes.**
Lijie Chen, Zhenjian Lu, Igor Oliveira, <u>Hanlin Ren</u>, and Rahul Santhanam
FOCS 2023.

🔖 **Bounded Relativization.**
Shuichi Hirahara, Zhenjian Lu, and <u>Hanlin Ren</u>
CCC 2023.

🔖 **Range Avoidance, Remote Point, and Hard Partial Truth Table via Satisfying-Pairs Algorithms.**
Yeyuan Chen, Yizhi Huang, Jiatu Li, and <u>Hanlin Ren</u>.
STOC 2023.

🔖 **NP-Hardness of Approximating Meta-Complexity: A Cryptographic Approach.**
Yizhi Huang, Rahul Ilango, and <u>Hanlin Ren</u>
STOC 2023.

🔖 **On the Range Avoidance Problem for Circuits.**
<u>Hanlin Ren</u>, Rahul Santhanam, and Zhikun Wang.
FOCS 2022.

🔖 **Maintaining Exact Distances under Multiple Edge Failures.**
Ran Duan and <u>Hanlin Ren</u>.
STOC 2022.

🔖 **Robustness of Average-Case Meta-Complexity via Pseudorandomness.**
Rahul Ilango, <u>Hanlin Ren</u>, and Rahul Santhanam.
STOC 2022.

🔖 **A Relativization Perspective on Meta-Complexity.**
<u>Hanlin Ren</u> and Rahul Santhanam.
STACS 2022.

🔖 **Hardness of KT Characterizes Parallel Cryptography.**
<u>Hanlin Ren</u> and Rahul Santhanam.
CCC 2021. *Invited to the ToC special issue for CCC 2021.*

Publications (Continued)

- **Constructing a Distance Sensitivity Oracle in $O(n^{2.5794}M)$ Time.**
  Yong Gu and <u>Hanlin Ren</u>.
  ICALP 2021.

- **Approximate Distance Oracles Subject to Multiple Vertex Failures.**
  Ran Duan, Yong Gu, and <u>Hanlin Ren</u>.
  SODA 2021.

- **Improved Distance Sensitivity Oracles with Subcubic Preprocessing Time.**
  <u>Hanlin Ren</u>.
  ESA 2020. *Invited to the JCSS special issue for ESA 2020.*

- **Strong Average-Case Circuit Lower Bounds from Non-trivial Derandomization.**
  Lijie Chen and <u>Hanlin Ren</u>.
  STOC 2020. *Invited to the SICOMP special issue for STOC 2020.*

- **Approximating All-Pair Bounded-Leg Shortest Path and APSP-AF in Truly-Subcubic Time.**
  Ran Duan and <u>Hanlin Ren</u>.
  ICALP 2018.

Manuscripts / In Submission

- **Symmetric Exponential Time Requires Near-Maximum Circuit Size.**
  Lijie Chen, Shuichi Hirahara, and <u>Hanlin Ren</u>

Academic Talks

- **Polynomial-Time Pseudodeterministic Construction of Primes.**
DIMAP Seminar, University of Warwick.	Jun 2023
TCS+. https://youtu.be/yalaX02fVow	Sep 2023
Algorithms and Complexity Theory Seminars, University of Oxford.	Oct 2023

- **NP-Hardness of Approximating Meta-Complexity: A Cryptographic Approach.**
Minimal Complexity Assumptions for Cryptography, Meta-Complexity 2023, Simons Institute. https://youtu.be/v9JiEf2WH58	May 2023
ICT, Chinese Academy of Sciences (online).	May 2023
STOC 2023. https://youtu.be/DtJQ5-3zptE	Jun 2023

- **Robustness of Average-Case Meta-Complexity.**
Seminar at Meta-Complexity 2023, Simons Institute.	Mar 2023

- **Bounded Relativization.**
Student Seminar, Meta-Complexity 2023, Simons Institute.	Feb 2023
CCC 2023.	Jul 2023

- **Range Avoidance, Remote Point, and Hard Partial Truth Table via Satisfying-Pairs Algorithms.**
Lower Bounds, Learning, and Average-Case Complexity, Meta-Complexity 2023, Simons Institute. https://youtu.be/pd45Av1iTlw	Feb 2023
STOC 2023.	Jun 2023

- **Recent Advances in the Range Avoidance Problem.**
Yaoclass Seminar (online).	Dec 2022

- **Range Avoidance Part II: Beyond Circuit Lower Bounds.**
New Directions in Derandomization, FOCS 2022 Workshop. https://vimeo.com/user39621409/review/772183410/1201f3a1d4	Nov 2022

Academic Talks (Continued)

- **On the Range Avoidance Problem for Circuits.**
  ICMS workshop on Mathematical Approaches to Lower Bounds: Complexity of Proofs
  and Computation. Jul 2022
  Warwick complexity meetings (online). Aug 2022
  FOCS 2022. https://vimeo.com/user39621409/review/771296149/46488425a3 Nov 2022

- **Maintaining Exact Distances under Multiple Edge Failures.**
  STOC 2022. http://youtu.be/B1wMXgTCy8o Jun 2022

- **A Relativization Perspective on Meta-Complexity.**
  STACS 2022 (online). Mar 2022

- **Faster Algorithms for Distance Sensitivity Oracles.**
  IJTCS 2021 (hybrid). Aug 2021
  Yaoclass Seminar. Nov 2021

- **Constructing a Distance Sensitivity Oracle in $O(n^{2.5794}M)$ Time.**
  ICALP 2021 (online). http://youtu.be/uIFoucab6d4 Jul 2021

- **Hardness of KT Characterizes Parallel Cryptography.**
  DIMACS workshop on meta-complexity, barriers, and derandomization. http://youtu.
  be/hZZaEuumtTY Apr 2022
  CCC 2021 (online). http://youtu.be/esFxj1cNLCE Jul 2021
  Yaoclass Seminar. Apr 2021
  Oxford-Warwick complexity meetings (online). Apr 2021

- **Approximate Distance Oracles Subject to Multiple Vertex Failures.**
  SODA 2021 (online). https://player.vimeo.com/video/496602190. Jan 2021
  Yaoclass Seminar. Dec 2020

- **Improved Distance Sensitivity Oracles with Subcubic Preprocessing Time.**
  ESA 2020 (online). https://youtu.be/2Z46AybFkJ8. Sep 2020

- **Strong Average-Case Circuit Lower Bounds from Non-trivial Derandomization.**
  STOC 2020 (online). https://youtu.be/xWDQ4LefOVs. Jun 2020
  SIGMA, ICT, Chinese Academy of Sciences (online). Mar 2020

- **Approximating All-Pair Bounded-Leg Shortest Path and APSP-AF in Truly-Subcubic
  Time.**
  ICALP 2018. Jul 2018

Special Issue Invitation

- STOC 2020, ESA 2020, CCC 2021

Teaching Experience

2020 Fall	**Design and Analysis of Algorithms** (graduate level) *Instructor: Prof. Ran Duan* Teaching assistant
2021 Spring	**Theory of Computation** (undergraduate level) *Instructor: Prof. Ran Duan* Teaching assistant
2022 Michaelmas Term	**Advanced Complexity Theory** (Part C) *Instructor: Prof. Rahul Santhanam* Marker and tutor

Selected Awards

2021	▌	Clarendon Scholarship
2019	▌	Yao Award, bronze prize
2018	▌	Evergrande Scholarship
2017	▌	Baidu "Future Star" Scholarship
2015	▌	Gold medal (15th place) in Chinese National Olympiad in Informatics (NOI)