WALCOM
International Conference and Workshops on Algorithms and Computation
31 March–2 April 2020
Singapore
Sponsor:

National University of Singapore  

Institute for Mathematical Sciences

International Conference and Workshops on Algorithms and Computation (WALCOM) 2020
31 Mar–2 Apr 2020
For more details, please visit
https://www.comp.nus.edu.sg/~walcom20
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About WALCOM

The 14th International Conference and Workshop on Algorithms and Computation (WALCOM) is intended to provide an international forum for researchers working in the areas of algorithms and computation. WALCOM 2020 will be held during March 31 - April 02, 2020 at the Institute for Mathematical Sciences, National University of Singapore.

The range of topics within the scope of WALCOM includes but is not limited to:

- Approximation Algorithms
- Algorithmic Graph Theory and Combinatorics
- Combinatorial Algorithms
- Combinatorial Optimization
- Computational Biology
- Computational Complexity
- Computational Geometry
- Discrete Geometry
- Data Structures
- Experimental Algorithm Methodologies
- Graph Algorithms
- Graph Drawing
- Parallel and Distributed Algorithms
- Parameterized Algorithms
- Parameterized Complexity
- Network Optimization
- Online Algorithms
- Randomized Algorithms
- String Algorithms
Organizing committee

• Ho Siew Foong (National University of Singapore)
• Zaini Mohd (National University of Singapore)
• Kwok Pui Choi (National University of Singapore)
• Vaibhav Rajan (National University of Singapore)
• Wing-Kin Sung, Ken (National University of Singapore)

Steering committee

• Kyung-Yong Chwa (KAIST, Korea)
• Costas S. Iliopoulos (KCL, UK)
• M. Kaykobad (BUET, Bangladesh)
• Petra Mutzel (TU Dortmund, Germany)
• Shin-ichi Nakano (Gunma University, Japan)
• Subhas Chandra Nandy (Indian Statistical Institute, Kolkata, India)
• Takao Nishizeki (Tohoku University, Japan)
• C. Pandu Rangan (IIT, Madras, India)
• Md. Saidur Rahman (BUET, Bangladesh)

Program committee

Hee-Kap Ahn    Md. Shamsuzzoha Bayzid    Guillaume Blin
Hans Bodlaender    Gautam K Das    Jackie Daykin
Mark de Berg    Wing-Kai Hon    Seok-Hee Hong
Jesper Jansson    Ralf Klasing    Gad M. Landau
Inbok Lee    Giuseppe Liotta    Takaaki Mizuki
Debajyoti Mondal    Krishnendu Mukhopadhyaya    Shin-Ichi Nakano
Solon Pissis    Simon Puglisi    Tomasz Radzik
M. Sohel Rahman, Chair    Atif Rahman    Wojciech Rytter
Kunihiro Sadakane, Chair    William F. Smyth    Paul Spirakis
Wing-Kin Sung, Chair    Etsuji Tomita    Ryuhei Uehara
Bruce Watson    Sue Whitesides    Hsu-Chun Yen
Timetable

ZOOM ID for conference: https://nus-sg.zoom.us/j/137697509
SN: Session  IT: Invited Talk
Timings stated in the schedule is at SINGAPORE time (UTC +8:00 hours)

Tuesday, 31 March

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>9:30–10:15</td>
<td>Registration</td>
</tr>
<tr>
<td>10:15–10:30</td>
<td>Opening</td>
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<tr>
<td></td>
<td>Session Chair Wing-Kin Sung, Ken (NUS)</td>
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<tr>
<td>10:30–11:00</td>
<td>SN Session 1 Complexity</td>
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<tr>
<td>11:00–11:30</td>
<td>Tea</td>
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<tr>
<td></td>
<td>Chair Wing-Kin Sung, Ken (NUS)</td>
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<tr>
<td>11:30–12:30</td>
<td>IT Osamu Watanabe Space Efficient Separator</td>
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<td></td>
<td>algorithms for planar graphs</td>
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<tr>
<td>12:30–14:00</td>
<td>Lunch</td>
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<tr>
<td></td>
<td>Session Chair Ramesh Rajaby (NUS)</td>
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<tr>
<td>14:00–16:00</td>
<td>SN Session 2 String</td>
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<tr>
<td>16:00–16:30</td>
<td>Tea</td>
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<tr>
<td>16:30–17:30</td>
<td>WALCOM Business Meeting</td>
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Wednesday, 1 April

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>9:00–10:30</td>
<td>SN Session 3 Robot or routing</td>
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<tr>
<td>10:30–11:00</td>
<td>Tea</td>
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<tr>
<td></td>
<td>Chair Ritu Kundu (NUS)</td>
</tr>
<tr>
<td>11:00–12:00</td>
<td>IT Md. Saidur Rahman Drawing Planar Graphs</td>
</tr>
<tr>
<td>12:00–13:30</td>
<td>Lunch</td>
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<tr>
<td></td>
<td>Session Chair Wing-Kin Sung, Ken (NUS)</td>
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<tr>
<td>13:30–15:00</td>
<td>SN Session 4 Graph (and graph drawing)</td>
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<tr>
<td>15:00–16:00</td>
<td>Tea</td>
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<td></td>
<td>Session Chair Wing-Kin Sung, Ken (NUS)</td>
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<tr>
<td>16:00–17:30</td>
<td>SN Session 5 Planar graph</td>
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### Thursday, 2 April

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Chair</th>
<th>Session</th>
<th>Description</th>
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<tbody>
<tr>
<td>9:00–10:30</td>
<td>SN</td>
<td>Session 6</td>
<td>3 papers</td>
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<td></td>
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<td><strong>Graph 2</strong></td>
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<tr>
<td>10:30–11:00</td>
<td>SN</td>
<td><strong>Tea</strong></td>
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<td></td>
<td>Wing-Kin Sung, Ken (National University of Singapore)</td>
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<tr>
<td>11:00–12:00</td>
<td>IT</td>
<td>Louxin Zhang</td>
<td>Recent progresses in the combinatorial and algorithmic study of phylogenetic networks</td>
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<td></td>
<td></td>
<td>Singapore</td>
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<tr>
<td>12:00–13:30</td>
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<td><strong>Lunch</strong></td>
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<td>Wing-Kin Sung, Ken (National University of Singapore)</td>
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<tr>
<td>13:30–15:00</td>
<td>SN</td>
<td>Session 7</td>
<td>3 papers</td>
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<td><strong>Bipartite graph</strong></td>
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<tr>
<td>15:00–15:30</td>
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<td><strong>Tea</strong></td>
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<td></td>
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<td></td>
<td>Wing-Kin Sung, Ken (National University of Singapore)</td>
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<tr>
<td>15:30–17:00</td>
<td>SN</td>
<td>Session 8</td>
<td>3 papers</td>
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<td></td>
<td><strong>Algorithm</strong></td>
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<tr>
<td>17:00–17:30</td>
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<td></td>
<td><strong>Closing</strong></td>
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General Information

In this programme booklet, you will find the names of the speakers and time of the presentations. For each session, the presentation time for each paper is 30 minutes, which includes time for Q&A.

All attendees will have to register via the link in order to join in the meeting via ZOOM: https://nus-sg.zoom.us/j/137697509

Upon registration, you will receive the link for the meeting, and how to join it. https://support.zoom.us/hc/en-us/articles/201362193-Joining-a-Meeting

Information for speakers

- Facilitator/chair will be in the meeting room about 30 minutes before each session.
- Facilitator/chair will mute participants before each talk.
- The Q&A and chat session will be facilitated after the speaker finishes his/her presentation.

Information about ZOOM for speakers

We will ask you to share your screen, so you can show your slides. https://support.zoom.us/hc/en-us/articles/201362153-Sharing-your-screen

There is an annotate function if you would like to use it: https://support.zoom.us/hc/en-us/articles/201362193-Joining-a-Meeting
Information for participants

- Mute your speaker/microphone during the talk.
- Speaker will present their talk first (about 20 to 25 mins)
- Q&A will be at the end of the talk (about 5 to 10 mins).
- For everyone to hear your clearly, please speak directly into your microphone.

The raise hand feature in ZOOM allows attendees to raise their hand to indicate that they would like to raise a question.

Raise Hand In Webinar:
https://support.zoom.us/hc/en-us/articles/205566129-Raise-Hand-In-Webinar

In-Meeting Chat:
https://support.zoom.us/hc/en-us/articles/203650445-In-Meeting-Chat
List of Abstracts – Talks

Tuesday 31 March

Session 1

Angle Covers: Algorithms and Complexity (Online Presentation)

*William Evans, Ellen Gethner, Jack Spalding-Jamieson*¹ and *Alexander Wolff*

¹ University of British Columbia, Canada

Invited Talk 1

Space Efficient Separator Algorithms for Planar Graphs (Online Presentation)

*Osamu Watanabe*

Tokyo Institute of Technology, Japan
Session 2

Generalized Dictionary Matching under Substring Consistent Equivalence Relations (Online Presentation)

Diptarama Hendrian
Tohoku University, Japan

Shortest Covers of All Cyclic Shifts of a String (Online Presentation)

Maxime Crochemore, Costas Iliopoulos, Jakub Radoszewski, Wojciech Rytter, Juliusz Straszynski\(^1\), Tomasz Walen and Wiktor Zuba
\(^1\) University of Warsaw, Poland

Fast Multiple Pattern Cartesian Tree Matching (Online Presentation)

Geonmo Gu\(^1\), Siwoo Song, Simone Faro, Thierry Lecroq and Kunsoo Park
\(^1\) Seoul National University, Korea

Faster Privacy-Preserving Computation of Edit Distance with Moves (Online Presentation)

Youhei Yoshimoto, Masaharu Kataoka\(^1\), Yoshimasa Takabatake, Tomohiro I, Kilho Shin and Hiroshi Sakamoto
\(^1\) Kyushu Institute of Technology, Japan
Wednesday 1 April

Session 3

Dispersion of Mobile Robots on Grids (Online Presentation)

Ajay Kshemkalyani, Anisur Rahaman Molla and Gokarna Sharma

1 Indian Statistical Institute, Kolkata, India

Optimum Algorithm for the Mutual Visibility Problem (Online Presentation)

Subhash Bhagat

Indian Statistical Institute, India

Routing in Histograms (Online Presentation)

Man Kwun Chiu, Jonas Cleve, Katharina Nost, Matias Korman, Wolfgang Mulzer, André van Renssen, Marcel Roeloffzen and Max Willert

1 Freie Universität Berlin, Germany

Invited talk 2

Drawing Planar Graphs (Online Presentation)

Md. Saidur Rahman

Bangladesh University of Engineering and Technology, Bangladesh
Session 4

Partitioning a graph into complementary subgraphs (Online Presentation)

**Julliano Rosa Nascimento**¹, **Uevertou Souza and Jayme Szwarcfiter**

¹Universidade Federal de Goiás, Brazil

Reconfiguring $k$-path vertex covers (Online Presentation)

**Duc A. Hoang, Akira Suzuki and Tsuyoshi Yagita**¹

¹Kyushu Institute of Technology, Japan

Parameterized Algorithms for the Happy Set Problem (short) (Online Presentation)

**Yuichi Asahiro, Hiroshi Eto, Tesshu Hanaka**¹, **Guohui Lin, Eiji Miyano**² and **Ippei Terabaru**

¹Chuo University, Japan
²Kyushu Institute of Technology, Japan
Session 5

Packing Trees into 1-planar Graphs (Online Presentation)

Felice De Luca, Emilio Di Giacomo, Seok-Hee Hong, Stephen Kobourov, William Lenhart, Giuseppe Liotta, Henk Meijer, Alessandra Tappini and Steve Wismath

1 University of Perugia, Italy

The Stub Resolution of 1-planar Graphs (Online Presentation)

Michael Kaufmann, Jan Kratochvil, Fabian Lipp, Fabrizio Montecchiani, Chrysanthi Raftopoulou and Pavel Valtr

1 University of Perugia, Italy

An Experimental Study of a 1-planarity Testing and Embedding Algorithm (short) (Online Presentation)

Carla Binucci, Walter Didimo and Fabrizio Montecchiani

1 University of Perugia, Italy
Thursday 2 April

Session 6

Efficient Enumeration of Non-isomorphic Ptolemaic Graphs (Online Presentation)

Dat Hoang Tran and Ryuhei Uehara¹

¹ Japan Advanced Institute of Science and Technology, Japan

Implicit Enumeration of Topological-Minor-Embeddings and Its Application to Planar Subgraph Enumeration (Online Presentation)

Yu Nakahata¹, Jun Kawahara, Takashi Horiyama and Shin-Ichi Minato

¹ Kyoto University, Japan

Designing Survivable Networks with Zero-suppressed Binary Decision Diagrams (Online Presentation)

Hirofumi Suzuki¹, Masakazu Ishihata and Shin-Ichi Minato

¹ Fujitsu Laboratories Ltd, Japan

Invited Talk 3

Recent progresses in the combinatorial and algorithmic study of phylogenetic networks (Online Presentation)

Louxin Zhang

National University of Singapore, Singapore
Approximability of the Independent Feedback Vertex Set Problem for Bipartite Graphs (Online Presentation)

Yuma Tamura¹, Takehiro Ito and Xiao Zhou

¹ Tohoku University, Japan

On the Maximum Edge-Pair Embedding Bipartite Matching (Online Presentation)

Cam Ly Nguyen, Vorapong Suppakitpaisarn, Athasit Surarerks and Phanu Vajanopath¹

¹ Chulalongkorn University, Thailand

Packing Arc-Disjoint Cycles in Bipartite Tournaments (Online Presentation)

Ajay Saju Jacob¹ and R. Krithika

¹ Indian Institute of Technology Madras, India
Session 8

A Waste-Efficient Algorithm for Single-Droplet Sample Preparation on Microfluidic Chips (Online Presentation)

*Miguel Coviello Gonzalez and Marek Chrobak*¹

¹ University of California, Riverside, USA

Matching random colored points with rectangles (Online Presentation)

*Carlos Seara*¹, *Josué Corujo, David Flores-Peñaloza, Clemens Huemer and Pablo Pérez-Lantero*

¹ Universidad Politécnica de Cataluña, Spain

Trichotomy for the reconfiguration problem of integer linear systems (short) (Online Presentation)

*Kei Kimura*¹ and *Akira Suzuki*

¹ Saitama University, Japan
Contact Information

For queries on abstract submission and scientific programme, please contact:

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National University of Singapore
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