Hsiang-Yun Wu

Academic Curriculum Vitæ (September 2022)

✉ *hsiang.yun.wu@acm.org*
yun-vis.net
ORCID: 0000-0003-1028-0010
ResearcherID: T-8434-2018

Personal Information

Nationality **Taiwan**

Gender **Female**

Academic Education

2010–2013 **Ph.D.**, *Takahashi Research Group (Visualization Laboratory)*, Department of Complexity Science and Engineering, Graduate School of Frontier Sciences
The University of Tokyo, Japan (2022 QS WUR: 23, 2022 QS WUR By Subject: 27)[1]

2006–2008 **MSc**, *Computational Theory Laboratory*, Department of Electrical Engineering, Graduate Institute of Electrical Engineering
National Taiwan University, Taiwan (2022 QS WUR: 68, 2022 QS WUR By Subject: 62)

2001–2006 **BSc**, *Department of Atmospheric Science*
National Taiwan University, Taiwan (2022 QS WUR: 68, 2022 QS WUR By Subject: 62)

Professional Profile

Oct. 2021 – Present **Scientific Staff & Lecturer (Permanent)**, *Department of Media & Digital Technologies*
St. Pölten University of Applied Sciences, Austria

Jun. 2019 – Present **Senior Researcher**, *Institute of Visual Computing & Human-Centered Technology*
TU Wien, Austria (2022 QS WUR: 180, 2022 QS WUR By Subject: 89)

Apr. 2015 – Present **Visiting Researcher**, *Center for Spatial Information Science*
The University of Tokyo, Japan (2022 QS WUR: 23, 2022 QS WUR By Subject: 27)

Oct. 2016 – Nov. 2016 **Visiting Professor**, *National Engineering Laboratory of Big Data Analysis and Application*
Peking University, China (2022 QS WUR: 18, 2022 QS WUR By Subject: 20)

Apr. 2015 – May. 2017 **Project Assistant Professor**, *Department of Information and Computer Science*, Graduate School of Science and Technology
Keio University, Japan (2022 QS WUR: 201, 2022 QS WUR By Subject: 151-200)

Apr. 2014 – Mar. 2015 **Project Assistant Professor**, *Department of Computer Science*, Graduate School of Information Science and Technology
The University of Tokyo, Japan (2022 QS WUR: 23, 2022 QS WUR By Subject: 27)

Oct. 2013 – Apr. 2014 **Project Assistant Professor**, *Department of Complexity Science and Engineering*, Graduate School of Frontier Sciences
The University of Tokyo, Japan (2022 QS WUR: 23, 2022 QS WUR By Subject: 27)

[1] The QS World University Rankings (WURs) is downloaded from https://www.topuniversities.com

Apr. 2013 – Oct. 2014 **Postdoctoral Researcher**, *Department of Complexity Science and Engineering*, Graduate School of Frontier Sciences
The University of Tokyo, Japan (2022 QS WUR: 23, 2022 QS WUR By Subject: 27)

Awards

Paper **Best Short Paper Award**, *IEEE Vis 2020*
Paper **Best Paper Award**, *CESCG 2020*
Paper **Best Paper Honorable Mention**, *EuroVis 2019*
Paper **SciVis Best Paper Honorable Mention**, *IEEE Vis 2018*
Paper **Best Paper Award**, *SCCG 2016*
Paper **Best Short Paper Award**, *SmartGraphics 2015*
Contest **1st Place Award in 24-Hour Science Map Contest**, *24-Hour Science Map 2021*
Contest **3rd Place Award in Graph Drawing Contest**, *GD 2020*
Contest **1at Place Award in Graph Drawing Contest**, *GD 2019*
Poster **Best Poster Award**, *SchematicMapping 2019*
Presentation **Best Presentation Award**, *SCCG 2016*

Main Areas of Research and Important Research Results

Main Areas of Research:

- **Visualization** in particular network visualization and multivariate data visualization (visual analytics, visual abstraction, machine-assisted algorithms, dynamic algorithms, label placement, automatic diagram synthesis, etc.)
- **Applied Data Analytics** in particular geospatial and biological data (road networks, social networks, biological pathways, gene networks, biological imaging, etc.)
- **Immersive Visualization and Physicalization** in particular information in mixed reality (text and image labeling in augmented reality, physical data models, etc).
- **Human Computer Interaction, Communication, and Education** in particular human perception experiments (perceptional experiment, educational experiments, etc.)
- **Computer Graphics and Multimedia** in particular vector graphics geometry and rendering (continuous line illustrations, origami, etc.)

Most important achievements:

- **Automatic Diagram Synthesis:** We contributed several layout and labeling algorithms, as well as studying the computational and perceptual scalability of the topic.
- **Applied Network Analytics:** Several layout approaches for biological network have been developed.We focus on the hierarchical properties of the data in the domain and correspondingly released several open-source software.
- **Cognition and Perception in Visualization:** investigates the limitation of human perception and take this limitation into consideration when creating dynamic visualizations.

Language Competence

Native **Chinese, Mandarin, Taiwanese**
Fluent **English, Japanese (JLPT Japanese-Language Proficiency Test, C1, 2009)**
Conversant **German (ÖSD Prüfungen A2, 2019), German (The European Language Certificates (telc) B1, 2022)**

Conference/Seminar Organization:

IEEE VIS **Panels Co-Chair**, *IEEE Visualization*, 2022

IEEE VIS **Community Co-Chair**, *IEEE Visualization*, 2021, 2020

SGIoT **Publicity Co-Chair**, *EAI International Conference on Smart Grid and Internet of Things*, 2022

C-J Vis 2022 **Workshop Co-Organizer**, *China-Japan Joint Visualization Workshop*
https://fj.ics.keio.ac.jp/cj2022/

CSIG-VIS **Organization Committee**, *CSIG-VIS International Lecture Series*, 2021-2022
http://chinavis.org/lectures/english/index_en.html

Bio+Med+Vis **Co-Organizer & Invited Speaker**, *Bio+Med+Vis Spring School*, 2021
http://biomedvis.github.io

Eurographics **Doctoral Consortium Co-Chair**, *Annual Conference of the European Association for Computer Graphics*, 2021

PacificVis **Short Paper Co-Chair**, *IEEE Pacific Visualization Symposium*, 2019

PacificVis **Poster Co-Chair**, *IEEE Pacific Visualization Symposium*, 2017

PacificVis **Webmaster & Design Chair**, *IEEE Pacific Visualization Symposium*, 2017, 2018, 2022

PacificVis **Publicity Co-Chair**, *IEEE Pacific Visualization Symposium*, 2014, 2020, 2021, 2022

GD **Core Local Organizer &Publicity Chair**, *International Symposium on Graph Drawing and Network Visualization*, 2022

Dagstuhl **Dagstuhl Organizer**, *Dagstuhl Seminar 22031:Bringing Graph Databases and Network Visualization Together*, January, 2022

Shonan **Shonan Meeting Organizer**, *Shonan Meeting 183: Understanding the "Why" of Data and Knowledge Models*, 2022

Shonan **Shonan Meeting Organizer**, *Shonan Meeting 173: Toughening the Foundation of Abstraction in Visualization Techniques*, 2022

ChinaVis **International Forum Co-Chair**, *China Visualization and Visual Analytics Conference*, 2019-2022

BIOKDD **Paper Co-Chair**, *The 19th International Workshop on Data Mining in Bioinformatics*, 2020

TopoInVis **Core Local Organizer**, *Topology-Based Methods in Visualization*, 2017

NICOGRAPH **Webmaster & Design Chair**, *The Annual International Conference NICOGRAPH*, 2017

VRCAI **Treasurer**, *ACM SIGGRAPH International Conference on Virtual Reality Continuum and Its Applications in Industry*, 2015

BDVA **Publicity Co-Chair**, *International Symposium on Big Data Visual Analytics*, 2015

Editors:

Frontiers **Guest Associate Editor**, *Frontiers in Bioinformatics*, Networks and Graphs in Biological Data: Current Methods, Opportunities and Challenges, 2022
https://www.frontiersin.org/research-topics/43810/networks-and-graphs-in-biological-data-current-methods-oppo

IEEE/ACM **Guest Associate Editor**, *IEEE Computer Graphics and Applications*, Special Issue on Integrating Graph Databases and Network Visualization: Concepts and Applications, 2022
https://www.computer.org/digital-library/magazines/cg/cfp-databases-network-visualization

IEEE/ACM **Guest Associate Editor**, *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, BIOKDD2020 Special Issue, 2021
https://mc.manuscriptcentral.com/tcbb-cs

Frontiers **Guest Associate Editor**, *AI-enabled Data Science for COVID-19, Medicine and Public Health*, 2021
https://www.frontiersin.org/research-topics/16237/ai-enabled-data-science-for-covid-19

Frontiers **Review Editor**, *Data Visualization, Frontiers in Bioinformatics*, 2021-
https://www.frontiersin.org/journals/bioinformatics/sections/data-visualization

Frontiers **Review Editor**, *Computer Graphics and Visualization, Frontiers in Computer Science*, 2021-
https://www.frontiersin.org/journals/computer-science/sections/computer-graphics-and-visualization

International Program Committee Members:

Full Paper

IEEE VIS **IEEE Visualization**, *2020-2022*

EuroVis **EG/VGTC Conference on Visualization**, *2019-2021*

PacificVis **IEEE Pacific Visualization Symposium**, *2016-2022*

PacificGraphics **Pacific Graphics conference**, *2022*

GD **International Symposium on Graph Drawing and Network Visualization**, *2019, 2021*

ChinaVis **China Visualization and Visual Analytics Conference**, *2017-2022*

IVAPP **International Conference on Information Visualization Theory and Application**, *2021*

NICOGRAPH **NICOGRAPH International**, *2018*

VINCI **International Symposium on Visual Information Communication and Interaction**, *2015-2017*

BDDAC **International Symposium on Big Data and Data Analytics in Collaboration**, *2015-2016*

Short Paper

IEEE VIS **IEEE Visualization Short Paper Program**, *2020- 2021*

EuroVis **EG/VGTC Conference on Visualization Short Paper Program**, *2020-2021*

PacificVis **IEEE Pacific Visualization Symposium Notes Program**, *2016-2018*

Poster/Abstract

CompCarto **Workshop on Computational Cartography**, *2022*

EuroVis **EG/VGTC Conference on Visualization**, *2022*

Reviewing (Excluding review records as IPC members):

Journals

Taylor&Francis **Optimization Methods and Software**, *2022-*

IEEE Network **IEEE Network Magazine**, *2022-*

TVCG **IEEE Transactions on Visualization and Computer Graphics**, *2014, 2016, 2020-2021*

CGF **Computer Graphics Forum**, *2018,2021*

CG&A **IEEE Computer Graphics and Applications**, *2022*

GOMS **Optimization Methods and Software** , *2022*

WINE **Springer Wireless Networks: The Journal of Mobile Communication, Computation and Information**, *2022-*

EuroVis **EG/VGTC Conference on Visualization State-of-the-Art Paper Program**, *2021*

BDR **Journal of Big Data Research (Elsevier)**, *2021*

FrontBioinf **Data visualization, Frontiers in Bioinformatics**, *2020*

JGAA **Journal of Graph Algorithms and Applications**, *2019-2020*

IEEE Access **IEEE Access**, *2020*

VISINF **Visual Informatics**, *2022*

JOVI **Journal of Visualization**, *2016-2022*

TiiS **ACM Transactions on Interactive Intelligent Systems**, *2019*

IEEE VIS **IEEE Visualization**, *2014-2015, 2017-2019*

TBD **IEEE Transactions on Big Data**, *2018*

EuroVis **Eurographics/IEEE Conference on Visualization**, *2016-2018*

GIS **Journal Geo-spatial Information Science**, *2018*

MDPI **ISPRS International Journal of Geo-Information**, *2017-2018*

PacificGraphics **Pacific Conference on Computer Graphics and Applications**, *2015, 2017*

C&G **Journal of Computers & Graphics (Elsevier)**, *2013, 2015, 2017, 2020*

CN **Journal of Computer Networks (Elsevier)**, *2017*

JLVC **Journal of Visual Languages and Computing**, *2016*

IJGIS **International Journal of Geographical Information Science**, *2013*

Conferences

CHI **ACM CHI Conference on Human Factors in Computing Systems**, *2021*

IEEEVR **IEEE Conference on Virtual Reality and 3D User Interfaces**, *2021*

UIST **ACM Symposium on User Interface Software and Technology**, *2017*

PacificVis **IEEE Pacific Visualization Symposium**, *2014-2019*

COCOA **Conference on Combinatorial Optimization and Applications**, *2016*

IEVC **IIEEJ International Workshop on Image Electronics and Visual Computing**, *2014, 2016*

Domestic Journals

IIEEJ **The Journal of the Institute of Image Electronics Engineers of Japan**, *2015*

Transactions of the Visualization Society of Japan, *2012*

Conference Website Design & Maintenance:

GD 2022 **International Symposium on Graph Drawing and Network Visualization**
http://graphdrawing.github.io/gd2022/

PacificVis 2022 **IEEE Pacific Visualization Symposium**
http://pvis2022.github.io/pvis2022/

C-J Vis 2022 **China-Japan Joint Visualization Workshop**
https://fj.ics.keio.ac.jp/cj2022/

PacificVis 2018 **IEEE Pacific Visualization Symposium**
http://itolab.is.ocha.ac.jp/pvis2018/

NICOGRAPH 2017 **NICOGRAPH International 2017**
http://art-science.org/nicograph/nicoint2017/

TopoInVis 2017 **Topology-Based Methods in Visualization**
http://fj.ics.keio.ac.jp/topoinvis/

PacificVis 2014 **IEEE Pacific Visualization Symposium**
http://fj.ics.keio.ac.jp/pvis2014/

Membership:

ACM **Association for Computing Machinery**, *May, 2015 – Present*

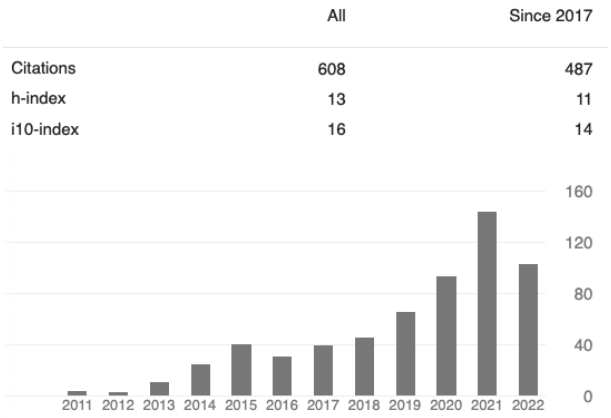
IEEE **IEEE Computer Society**, *February, 2011 – 2020*

JCA **Japan Cartographers Association**, *May, 2014 – 2020*

Full List of Publications

In general, I target high-level venues in the community of visualization. The primary journals (top two) and conferences (top three) I submit my papers to include TVCG (SCI), CGF (SCIE), IEEE Vis (SCI), EuroVis (SCIE), and PacificVis.

- DBLP: http://dblp.uni-trier.de/pers/hd/w/Wu:Hsiang=Yun
- Google Scholar: https://scholar.google.co.jp/citations?user=p_8UgtsAAAAJ&hl
- 24 peer reviewed journal publications
- 35 peer reviewed conference publications
- 1 books/book chapters
- total number of citations: 608
  (source: Google Scholar, September 8, 2022)
- h-index: 13
  (source: Google Scholar, September 8, 2022)
- i10-index: 16
  (source: Google Scholar, September 8, 2022)
- co-authors: 140
  (source: DBLP, September 8, 2022)



Google Scholar (September 8, 2022)

International Journal Articles (Peer-Reviewed):

[IJ1] Renata Raidou Marwin Schindler, Thorsten Korpitsch and Hsiang-Yun Wu. Nested papercrafts for anatomical and biological edutainment. *Computer Graphics Forum (Special Issue of EuroVis 2022)*, 2022. DOI: . to appear at EuroVis 2022.

[IJ2] Florian Ganglberger, Monika Wißmann, Hsiang-Yun Wu, Nicolas Swoboda, Andreas Thum, Wulf Haubensak, and Katja Bühler. Spatial-data-driven layouting for brain network visualization. *Computers & Graphics - Special Section on Visual Computing for Biology and Medicine*, 2022. DOI: https://doi.org/10.1016/j.cag.2022.04.014.

[IJ3] Tobias Batik, Soeren Nickel, Yu-Shuen Wand, Martin Nöllenburg, and Hsiang-Yun Wu. Shape-guided mixed metro map layout. *Computer Graphics Forum*, 2022. DOI: .

[IJ4] Hsiang-Yun Wu, Aleksandr Amirkhanov, Nicolas Grossmann, Tobias Klein, David Kouřil, Haichao Miao, Laura R. Luidolt, Peter Mindek, Renata G. Raidou, Ivan Viola, Manuela Waldner, and M. Eduard Gröller. Visualization working group at tu wien: Visibile facimus quod ceteri non possunt. *Visual Informatics*, 2021. DOI: 10.1016/j.visinf.2021.02.003.

[IJ5] Ladislav Čmolík, Václav Pavlovec, Hsiang-Yun Wu, and Martin Nöllenburg. Mixed labeling: Integrating internal and external labels. *IEEE Transactions on Visualization and Computer Graphics*, 2020. DOI: 10.1109/TVCG.2020.3027368.

[IJ6] Sherif Sakr, Angela Bonifati, Hannes Voigt, Alexandru Iosup, and The other Dagstuhl Seminar participants (Hsiang-Yun Wu). The future is big graphs! A community view on graph processing systems. *Communications of the ACM (CACM)*, 2020. DOI: 10.1145/3434642.

[IJ7] Renata Raidou, Eduard Gröller, and Hsiang-Yun Wu. Slice and dice: A physicalization workflow for anatomical edutainment. *Computer Graphics Forum*, pages 623–634, 2020. DOI: 10.1111/cgf.14173.

[IJ8] Thorsten Korpitsch, Shigeo Takahashi, Eduard Gröller, and Hsiang-Yun Wu. Simulated annealing to unfold 3D meshes and assign glue tabs. *Journal of World Society for Computer Graphics (WSCG)*, 28(1-2):47–56, May 2020. DOI: 10.24132/JWSCG.2020.28.6.

[IJ9] Hsiang-Yun Wu, Martin Nöllenburg, and Ivan Viola. Multi-level area balancing of clustered graphs. *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 2020. DOI: 10.1109/TVCG.2020.3038154.

[IJ10] Hsiang-Yun Wu, Benjamin Niedermann, Shigeo Takahashi, Maxwell J. Roberts, and Martin Nöllenburg. A survey on transit map layout from design, machine, and human perspectives. *Computer Graphics Forum (Special Issue of EuroVis 2020)*, 39(3):619–646, June 2020. DOI: 10.1111/cgf.14030.

[IJ11] Vahan Yoghourdjian, Daniel Archambault, Stephan Diehl, Tim Dwyer, Karsten Klein, Helen C. Purchase, and Hsiang-Yun Wu. Exploring the limits of complexity: A survey of empirical studies on graph visualisation. *Visual Informatics*, January 2019. DOI: 10.1016/j.visinf.2018.12.006.

[IJ12] Shigeo Takahashi, Ken Maruyama, Takamasa Kawagoe, Hsiang-Yun Wu, Kazuo Misue, and Masatoshi Arika. Mental map preservation for progressively labeling railway networks. *International Journal of Art, Culture and Design Technologies (IJACDT)*, 8(1):31–50, July 2019. DOI: 10.4018/IJACDT.2019010103.

[IJ13] Kazuyo Mizuno, Hsiang-Yun Wu, Shigeo Takahashi, and Takeo Igarashi. Optimizing stepwise animation in dynamic set diagrams. *Computer Graphics Forum (Special Issue of EuroVis 2019)*, 38(3):13–24, June 2019. DOI: 10.1111/cgf.13668. [Honorable Mention Award at EuroVis 2019].

[IJ14] David Kouřil, Ladislav Čmolík, Barbora Kozlikova, Hsiang-Yun Wu, Graham Johnson, David Goodsell, Arthur Olson, Meister Eduard Gröller, and Ivan Viola. Labels on levels: Labeling of multi-scale multi-instance and crowded 3D biological environments. *IEEE Transactions on Visualization and Computer Graphics*, January 2019. DOI: 10.1109/TVCG.2018.2864491. [Honorable Mention Award at IEEE Vis 2018].

[IJ15] Hsiang-Yun Wu, Martin Nöllenburg, Filipa L. Sousa, and Ivan Viola. Metabopolis: Scalable network layout for biological pathway diagrams in urban map style. *BMC Bioinformatics*, April 2019. DOI: 10.1186/s12859-019-2779-4.

[IJ16] Hsiang-Yun Wu, Shigeo Takahashi, and Rie Ishida. Overlap-free labeling of clustered networks based on voronoi tessellation. *Journal of Visual Languages & Computing*, 44:106–119, February 2018. DOI: 10.1016/j.jvlc.2017.09.008.

[IJ17] Byoungkwon An, Ye Tao, Jianzhe Gu, Tingyu Cheng, Xiang 'Anthony' Chen, Xiaoxiao Zhang, Wei Zhao, Youngwook Do, Shigeo Takahashi, Hsiang-Yun Wu, Teng Zhang, and Lining Yao. Thermorph: Democratizing 4D printing of self-folding materials and interfaces. *CHI 2018*, April 2018. DOI: 10.1145/3173574.3173834.

[IJ18] Makoto Uemura, Ryosuke Itoh, Ioannis Liodakis, Dmitry Blinov, Masanori Nakayama, Longyin Xu, Naoko Sawada, Hsiang-Yun Wu, and Issei Fujishiro. Optical polarization variations in the blazar pks 1749+096. *Publications of the Astronomical Society of Japan (PASJ)*, 69(6):96, November 2017. DOI: 10.1093/pasj/psx111.

[IJ19] Hsiang-Yun Wu, Shigeo Takahashi, Hiroko Nakamura Miyamura, Satoshi Ohzahata, and Akihito Kakao. Inferring partial orders of nodes for hierarchical network layout. *Journal of Imaging Science and Technology (JIST)*, 60(6):60407–1–60407–13, January 2017. DOI: 10.2352/J.ImagingSci.Technol.2016.60.6.060407.

[IJ20] Makoto Uemura, Ryosuke Itoh, Longyin Xu, Masanori Nakayama, Hsiang-Yun Wu, Kazuho Watanabe, Shigeo Takahashi, and Issei Fujishiro. Timetubes: Visualization of polarization variations in blazars. *Galaxies*, 4(3):23, September 2016. DOI: 10.3390/galaxies4030023.

[IJ21] D. Sakurai, O. Saeki, H. Carr, Hsiang-Yun Wu, T. Yamamoto, D. Duke, and S. Takahashi. Interactive visualization for singular fibers of functions f : R3 → R2. *IEEE Transactions on Visualization and Computer Graphics*, 22(1):945–954, Jan 2016. DOI: 10.1109/TVCG.2015.2467433.

[IJ22] Hsiang-Yun Wu, Shigeo Takahashi, Daichi Hirono, Masatoshi Arikawa, Chun-Cheng Lin, and Hsu-Chun Yen. Spatially efficient design of annotated metro maps. *Computer Graphics Forum (Special Issue of EuroVis 2013)*, 32(3):261–270, June 2013. DOI: 10.1111/cgf.12113. [Part of the doctoral thesis].

[IJ23] Hsiang-Yun Wu, Shigeo Takahashi, Chun-Cheng Lin, and Hsu-Chun Yen. Travel-route-centered metro map layout and annotation. *Computer Graphics Forum (Special Issue of EuroVis 2012)*, 31(3):925–934, June 2012. DOI: 10.1111/j.1467-8659.2012.03085.x. [Part of the doctoral thesis].

[IJ24] Shigeo Takahashi, Hsiang-Yun Wu, Seow Hui Saw, Chun-Cheng Lin, and Hsu-Chun Yen. Optimized topological surgery for unfolding 3D meshes. *Computer Graphics Forum (Special Issue of Pacific Graphics 2011)*, 30(7):2077–2086, September 2011. DOI: 10.1111/j.1467-8659.2011.02053.x.

International Conference Papers (Presentations at International Conferences)(Peer-Reviewed):

[IC1] Daniel Pahr, Hsiang-Yun Wu, and Renata Raidou. Vologram: An educational holographic sculpture for volumetric medical data physicalization. In *Short Paper Proceedings of the 11th Eurographics Workshop on Visual Computing for Biology and Medicine (VCBM2021)*, Paris, France, September 2021. DOI: 10.2312/vcbm.20211341.

[IC2] Thomas Köppel, Eduard Gröller, and Hsiang-Yun Wu. Context-responsive labeling in augmented reality. In *Proceedings of the 14th IEEE Pacific Visualization Symposium (PacificVis2021)*, Tianjin, China, April 2021. DOI: 10.1109/PacificVis52677.2021.00020.

[IC3] Sujoy Bhore, Guangping Li, Martin Nöllenburg, Ignaz Rutter, and Hsiang-Yun Wu. Untangling circular drawings: Algorithms and complexity. In *Proceedings of the 32nd International Symposium on Algorithms and Computation (ISAAC 2021)*, Fukuoka, Japan, December 2021. DOI: .

[IC4] Marwin Schindler, Hsiang-Yun Wu, and Renata Raidou. The anatomical edutainer. In *IEEE Vis Short Papers 2020*, pages 1–5, October 2020. DOI: 10.1109/VIS47514.2020.00007. [Best Short Paper Award at IEEE Vis 2020].

[IC5] Helen Purchase, Daniel Archambault, Stephen Kobourov, Martin Nöllenburg, Sergey Pupyrev, and Hsiang-Yun Wu. The turing test for graph drawing algorithms. In *Proceedings of the 28th International Symposium on Graph Drawing and Network Visualization (GD2020)*, Vancouver, Canada, September 2020. DOI: 10.1007/978-3-030-68766-3_36.

[IC6] Narumi Kuroko, Hayato Ohya, Takayuki Itoh, Nicolas Grossmann, and Hsiang-Yun Wu. Visualization of correlations between places of music listening and acoustic features. In *Proceedings of the 24th International Conference on Information Visualisation (iV2020)*, Vienna, Austria, September 2020. DOI: 10.1109/IV51561.2020.00014.

[IC7] Akari Iijima, Takayuki Itoh, Hsiang-Yun Wu, and Nicolas Grossmann. Visualization of semantic differential studies with a large number of images, participants and attributes. In *Proceedings of the 24th International Conference on Information Visualisation (iV2020)*, Vienna, Austria, September 2020. DOI: 10.1109/IV51561.2020.00011.

[IC8] Maximilian Sbardellati, Haichao Miao, Hsiang-Yun Wu, Eduard Gröller, and Ivan Viola Ivan Barisic. Interactive exploded views for molecular structures. In *Proceedings of the 9th Eurographics Workshop on Visual Computing for Biology and Medicine (VCBM2019)*, Brno, Czech, September 2019. DOI: 10.2312/vcbm.20191237.

[IC9] Ken Maruyama, Shigeo Takahashi, Hsiang-Yun Wu, Kazuo Misue, and Masatoshi Arika. Scale-aware cartographic displacement based on constrained optimization. In *Proceedings of the 23th International Conference on Information Visualisation (iV2019)*, Paris, France, July 2019. DOI: 10.1109/IV.2019.00022. [Best Paper Award at iV2019].

[IC10] Yuka Yoshida, Ken Maruyama, Takamasa Kawagoe, Hsiang-Yun Wu, Masatoshi Arikawa, and Shigeo Takahashi. Progressive annotation of schematic railway maps. In *Proceedings of the 22th International Conference on Information Visualisation (iV2018)*, Fisciano, Italy, July 2018. DOI: 10.1109/iV.2018.00070.

[IC11] Naoko Sawada, Masanori Nakayama, Hsiang-Yun Wu, Makoto Uemura, and Issei Fujishiro. Timetubes: Visual fusion and validation for ameliorating uncertainties of blazar datasets from different observatories. In *Proceedings of the Computer Graphics International Conference (CGI 2017)*, pages 14:1–14:6, Yokohama, Japan, June 2017. DOI: 10.1145/3095140.3095154.

[IC12] Hsiang-Yun Wu, Shigeo Takahashi, Sheung-Hung Poon, and Masatoshi Arikawa. Scale-adaptive placement of hierarchical map labels. In *Short Paper Proceedings of the 19th EG/VGTC Conference on Visualization (EuroVis2017)*, pages 1–5, Barcelona, Spain, June 2017. DOI: 10.2312/eurovisshort.20171124.

[IC13] Hsiang-Yun Wu, Shigeo Takahashi, Sheung-Hung Poon, and Masatoshi Arikawa. Introducing leader lines into scale-aware consistent labeling. In *Proceedings of the Advances in Cartography and GIScience: Selections from the International Cartographic Conference 2017 (ICACI 2017)*, pages 117–130, Washington, D.C., USA, July 2017. DOI: 10.1007/978-3-319-57336-6_9.

[IC14] Hsiang-Yun Wu, Yusuke Niibe, Kazuho Watanabe, Shigeo Takahashi, and Issei Fujishiro. Making many-to-many parallel coordinate plots scalable by asymmetric biclustering. In *Notes Proceedings of the 10th IEEE Pacific Visualization Symposium (PacificVis2017)*, pages 305–309, Seoul, Korea, April 2017. DOI: 978-1-5090-5738-2/17.

[IC15] Issei Fujishiro, Naoko Sawada, Masanori Nakayama, Hsiang-Yun Wu, Kazuho Watanabe, Shigeo Takahashi, and Makoto Uemura. Timetubes: Visual exploration of observed blazar datasets. In *Journal of Physics: Conference Series*, Kyoto, Japan, December 2017. DOI: 10.1088/1742-6596/1036/1/012011.

[IC16] Kouhei Yasuda, Shigeo Takahashi, and Hsiang-Yun Wu. Enhancing infographics based on symmetry saliency. In *Proceedings of the 9th International Symposium on Visual Information Communication and Interaction (VINCI 2016)*, pages 35–42, Dallas, USA, September 2016. DOI: 10.1145/2968220.2968224.

[IC17] Longyin Xu, Masanori Nakayama, Hsiang-Yun Wu, Kazuho Watanabe, Shigeo Takahashi, Makoto Uemura, and Issei Fujishiro. Timetubes: Design of a visualization tool for time-dependent, multivariate blazar datasets. In *Proceedings of the NICOGRAPH International 2016*, pages 15–20, Hangzhou, China, July 2016. DOI: 10.1109/NicoInt.2016.3.

[IC18] Kazuho Watanabe, Hsiang-Yun Wu, Shigeo Takahashi, and Issei Fujishiro. Asymmetric biclustering with constrained von mises-fisher models. In *Journal of Physics: Conference Series*, volume 699, page 012018, Kyoto, Japan, December 2016. DOI: 10.1088/1742-6596/699/1/012018.

[IC19] Makoto Uemura, Koji S Kawabata, Shiro Ikeda, Keiichi Maeda, Hsiang-Yun Wu, Kazuho Watanabe, Shigeo Takahashi, and Issei Fujishiro. Data-driven approach to type ia supernovae: Variable selection on the peak luminosity and clustering in visual analytics. In *Journal of Physics: Conference Series*, volume 699, page 012009, Kyoto, Japan, December 2016. DOI: 10.1088/1742-6596/699/1/012009.

[IC20] Rie Ishida, Shigeo Takahashi, and Hsiang-Yun Wu. Adaptive blending of multiple network layouts for overlap-free labeling. In *Proceedings of the 20th International Conference on Information Visualisation (iV2016)*, pages 15–20, Lisbon, Portugal, July 2016. DOI: 10.1109/IV.2016.25.

[IC21] Hsiang-Yun Wu. Focus+context metro map layout and annotation. In *Proceedings of Spring Conference on Computer Graphics (SCCG2016)*, Smolenice castle, Slovakia, April 2016. DOI: 10.1145/2948628.2948642. [Best Paper Award][2nd Best Paper Presentation Award].

[IC22] Kazuho Watanabe, Hsiang-Yun Wu, Yusuke Niibe, Shigeo Takahashi, and Issei Fujishiro. Biclustering multivariate data for correlated subspace mining. In *Proceedings of the 8th IEEE Pacific Visualization Symposium (PacificVis2015)*, pages 287–294, Hangzhou, China, April 2015. DOI: 10.1109/PACIFICVIS.2015.7156389.

[IC23] Fumiya Sato, Hsiang-Yun Wu, Shigeo Takahashi, and Masatoshi Arikawa. Extracting important routes from illustration maps using kernel density estimation. In *Proceedings of the 13th International Conference on Smart Graphics (SG2015)*, pages 167–174, Chengdun, China, August 2015. DOI: 10.1007/978-3-319-53838-9_14. [Best Short Paper Award].

[IC24] Yuki Ohtaka, Shigeo Takahashi, Hsiang-Yun Wu, and Naoya Ohta. Using mutual information for exploring optimal light source placements. In *Proceedings of the 13th International Conference on Smart Graphics (SG2015)*, pages 155–166, Chengdu, China, August 2015. DOI: 10.1007/978-3-319-53838-9_13.

[IC25] Rie Ishida, Shigeo Takahashi, and Hsiang-Yun Wu. Interactively uncluttering node overlaps for network visualization. In *Proceedings of the 19th International Conference on Information Visualisation (iV2015)*, pages 200–205, Barcelona, Spain, July 2015. DOI: 10.1109/iV.2015.44.

[IC26] Hsiang-Yun Wu, Sheung-Hung Poon, Shigeo Takahashi, Masatoshi Arikawa, Chun-Cheng Lin, and Hsu-Chun Yen. Designing and annotating metro maps with loop lines. In *Proceedings of the 19th International Conference on Information Visualisation (iV2015)*, pages 9–14, Barcelona, Spain, July 2015. DOI: 10.1109/iV.2015.14.

[IC27] Gao Yi, Hsiang-Yun Wu, Kazuo Misue, Kazuyo Mizuno, and Shigeo Takahashi. Visualizing bag-of-features image categorization using anchored maps. In *Proceedings of the 7th International Symposium on Visual Information Communication and Interaction (VINCI 2014)*, pages 39–48, Sydney, Australia, August 2014. DOI: 10.1145/2636240.2636858.

[IC28] Koto Nohno, Hsiang-Yun Wu, Kazuho Watanabe, Shigeo Takahashi, and Issei Fujishiro. Spectral-based contractible parallel coordinates. In *Proceedings of the 18th International Conference on Information Visualisation (iV2014)*, pages 7–12, Paris, France, July 2014. DOI: 10.1109/IV.2014.60.

[IC29] Kazuyo Mizuno, Hsiang-Yun Wu, and Shigeo Takahashi. Manipulating bilevel feature space for category-aware image exploration. In *Proceedings of the 7th IEEE Pacific Visualization Symposium (PacificVis2014)*, pages 217–224, Yokohama, Japan, March 2014. DOI: 10.1109/PacificVis.2014.58.

[IC30] Hsiang-Yun Wu, Shigeo Takahashi, Chun-Cheng Lin, and Hsu-Chun Yen. Voronoi-based label placement for metro maps. In *Proceedings of the 17th International Conference on Information Visualisation (iV2013)*, pages 96–101, London, UK, July 2013. DOI: 10.1109/IV.2013.11.

[IC31] Daichi Hirono, Hsiang-Yun Wu, Masatoshi Arikawa, and Shigeo Takahashi. Constrained optimization for disoccluding geographic landmarks in 3d urban maps. In *Proceedings of the 6th IEEE Pacific Visualization Symposium (PacificVis2013)*, pages 17–24, Sydney, Australia, March 2013. DOI: 10.1109/PacificVis.2013.6596123.

[IC32] Chun-Cheng Lin, Sheung-Hung Poon, Shigeo Takahashi, Hsiang-Yun Wu, and Hsu-Chun Yen. One-and-a-half-side boundary labeling. In *Proceedings of the 5th International Conference on Combinatorial Optimization and Applications (COCOA2011)*, pages 387–398, Zhangjiajie, China, August 2011. DOI: 10.1007/978-3-642-22616-8_30.

[IC33] Hsiang-Yun Wu, Shigeo Takahashi, Chun-Cheng Lin, and Hsu-Chun Yen. A zone-based approach for placing annotation labels on metro maps. In *Proceedings of the 11th International Conference on Smart Graphics (SG2011)*, volume 6815 of *Springer Lecture Notes in Computer Science*, pages 91–102, Bremen, Germany, July 2011. DOI: 10.1007/978-3-642-22571-0_8. [Part of the doctoral thesis].

[IC34] Chun-Cheng Lin, Hsiang-Yun Wu, and Hsu-Chun Yen. Boundary labeling in text annotation. In *Proceedings of the 13th International Conference on Information Visualisation (iV2009)*, pages 110–115, Barcelona, Spain, July 2009. DOI: 10.1109/IV.2009.84.

[IC35] *Planarizing Graphs and their Drawings by Vertex Splitting*, 2022.

Editorials, Parts in Books or Collections:

[IB1] Da Yan, Hong Qin, Hsiang-Yun Wu, and Jake Y. Chen. Editorial: Ai-enabled data science for covid-19. In *AI-Enabled Data Science for COVID-19*, November 2021. DOI: 10.3389/fdata.2021.802452.

[IB2] Sujoy Bhore, Guangping Li, Martin Nöllenburg, and Hsiang-Yun Wu. Untangling almost outerplanar drawings. In *The 37th International Symposium on Computational Geometry (SoCG) Young Researchers Forum*, New York, USA, June 2021.

[IB3] Hsiang-Yun Wu, Martin Nöllenburg, and Ivan Viola. Graph models for biological pathway visualization: State of the art and future challenges. In *The 1st Workshop on Multilayer Nets: Challenges in Multilayer Network Visualization and Analysis*, Vancouver, Canada, October 2019.

[IB4] Fumiya Sato, Hsiang-Yun Wu, Shigeo Takahashi, and Masatoshi Arikawa. Landmark-aware map deformation using graph drawing techniques. In *Proceedings of The International Symposium on Cartography in Internet and Ubiquitous Environments (CIU2015)*, Tokyo, Japan, March 2015.

[IB5] Osamu Saeki, Shigeo Takahashi, Daisuke Sakurai, Hsiang-Yun Wu, Keisuke Kikuchi, Hamish Carr, David Duke, and Takahiro Yamamoto. Visualizing multivariate data using singularity theory. In *The Impact of Applications on Mathematics (Proceedings of Forum Math-for-Industry 2013)*, pages 51–65, 2014.

Invited Talks and Lectures:

[IT1] Shigeo Takahashi and Hsiang-Yun Wu. Real-world examples toward visual diagram placement problems, September 2022. The 30th International Symposium on Graph Drawing and Network Visualization (https://graphdrawing.github.io/gd2022/).

[IT2] Hsiang-Yun Wu. Visual mapping for human-data communication, June 2022. Data Science, Statistics & Visualisation (https://iasc-isi.org/dssv2022/speakers/).

[IT3] Hsiang-Yun Wu. Map the knowledge for human-data communication, January 2022. Collaborative Research Center SFB-TRR 161 (Quantitative Methods for Visual Computing) (https://www.sfbtrr161.de).

[IT4] Hsiang-Yun Wu. Map the knowledge for human-data communication, July 2022. Summer School of Zhejiang University ().

[IT5] Hsiang-Yun Wu. Computational transit maps: The challenges, feasibility, and applications, May 2022. The 1st Workshop on Computational Cartography (http://www2.geoinfo.uni-bonn.de/html/visualization/compcarto/).

[IT6] Hsiang-Yun Wu. Computational network maps: The techniques and applications, July 2022. Summer School of Shandong University ().

[IT7] Hsiang-Yun Wu. Biological network visualization, May 2021. Bio+Med+Vis Spring School (http://biomedvis.github.io).

[IT8] Hsiang-Yun Wu, Martin Nöllenburg, Filipa L. Sousa, and Ivan Viola. Metabopolis: Scalable network layout for biological pathway diagrams in urban map style, July 2020. The annual International Conference on Intelligent Systems for Molecular Biology (ISMB), BioVis Community of Special Interest (COSI).

[IT9] Hsiang-Yun Wu. Constrained-based optimization for visibility management, February 2020. Kyoto University, Japan.

[IT10] Hsiang-Yun Wu. Atlas of knowledge: Untangling visual complexity through network visualization, February 2020. Research Center for Molecular Medicine of the Austrian Academy of Sciences (CeMM), Vienna, Austria.

[IT11] Hsiang-Yun Wu. Progressive annotation of schematic railway maps, December 2018. Czech Technical University, Prague, Czech Republic.

[IT12] Hsiang-Yun Wu. Geometry and data representation, October 2018. Dagstuhl Seminar 18442, Germany.

[IT13] Hsiang-Yun Wu. How to find an optimal layout for user-centric maps, July 2017. Zuse Institute Berlin, Berlin, Germany.

[IT14] Hsiang-Yun Wu. Visual analysis of multivariate data using network representation, December 2016. Sparse Modeling 2016 Symposium, Tokyo, Japan.

[IT15] Hsiang-Yun Wu. Egocentric design on traveling guide maps, October 2016. Peking University, Beijing, China.

[IT16] Hsiang-Yun Wu. Egocentric design on traveling guide maps, October 2016. Tianjin University, Tianjin, China.

[IT17] Hsiang-Yun Wu. Traveling guide maps visualization through constrained optimization, May 2015. Vienna University of Technology, Vienna, Austria.

[IT18] Hsiang-Yun Wu. Describing the world of information visualization using maps, September 2015. Information Visualization Research Seminar, Tokyo, Japan.

[IT19] Hsiang-Yun Wu. Designing annotated metro maps through constrained optimization, March 2014. Computer Visualization – Concepts and Challenges (NII Shonan Meeting Seminar 046), Shonan, Japan.

[IT20] Shigeo Takahashi and Hsiang-Yun Wu. Aesthetic design of map layouts through constrained optimization, May 2013. Japanese-Taiwanese Workshop on Information Visualization and Graph Drawing, Taipei, Taiwan.

Seminars and Workshops:

[S1] Hsiang-Yun Wu. Dagstuhl Seminar 22031: Bringing graph databases and network visualization together, January 2022.

[S2] Hsiang-Yun Wu. NII Shonan Meeting Seminar 183: Understanding the "why" of data and knowledge models, December 2021.

[S3] Hsiang-Yun Wu. NII Shonan Meeting Seminar 173: TAT: Toughening the foundation of abstraction in visualization techniques, May 2021.

[S4] Thorsten Korpitsch and Hsiang-Yun Wu. Optimising 3D mesh unfoldings with additional gluetabs using simulated annealing. In *Central European Seminar On Computer Graphics (CESCG)*, Smolenice, Slovakia, May 2020. [Best Paper Award at CESCG2020].

[S5] Hsiang-Yun Wu. NII Shonan Meeting Seminar 171: Trends and perspectives for graph drawing and network visualization, February 2020.

[S6] Hsiang-Yun Wu. NII Shonan Meeting Seminar 167: Formalizing biological and medical visualization, February 2020.

[S7] Hsiang-Yun Wu, Martin Nöllenburg, and Ivan Viol. A survey on computing schematic network maps: The challenge to interactivity. In *The 2nd Schematic Mapping Workshop*, Vienna, Austria, April 2019.

[S8] Hsiang-Yun Wu, Martin Nöllenburg, and Ivan Viol. Graph models for biological pathway visualization: State of the art and future challenges. In *The 1st Workshop on Multilayer Nets: Challenges in Multilayer Network Visualization and Analysis*, Vancouver, Canada, October 2019.

[S9] Hsiang-Yun Wu. Dagstuhl Seminar 19491: Big graph processing systems, December 2019.

[S10] Hsiang-Yun Wu. NII Shonan Meeting Seminar 127: Reimagining the mental map and drawing stability, September 2018.

[S11] Hsiang-Yun Wu. Dagstuhl Seminar 18442: Visualization and processing of anisotropy in imaging, geometry, and astronomy, October 2018.

[S12] Hsiang-Yun Wu. Dagstuhl Seminar 17332: Scalable set visualizations, July 2017.

[S13] Hsiang-Yun Wu. NII Shonan Meeting Seminar 085: Dynamic networks visual analytics: Approaches to facilitate visual analysis of complex and dynamic network data, August 2016.

[S14] Hsiang-Yun Wu. NII Shonan Meeting Seminar 054: Big graph drawing: metrics and methods, January 2015.

[S15] Hsiang-Yun Wu. NII Shonan Meeting Seminar 046: Computer visualization - concepts and challenges, March 2014.

Theses:

[T1] Hsiang-Yun Wu. *Constrained Optimization Approaches to Customizing Layout and Annotation for Metro Maps*. PhD thesis, The University of Tokyo, Chiba, Japan, March 2013. http://yun-vis.net/thesis/phd-thesis.pdf (password: cvviewer), [The dataset in the thesis is invited as a benchmark in MIPLIB 2017 – The Mixed Integer Programming Library, Zuse Institute Berlin (ZIB), Germany].

[T2] Hsiang-Yun Wu. Boundary label placement and its application to text annotation. Master's thesis, National Taiwan University, Taipei, Taiwan, July 2008. http://yun-vis.net/thesis/master-thesis.pdf (password: cvviewer).

Poster Presentations:

[IP1] Tobias Batik, Soeren Nickel, Martin Nöllenburg, Yu-Shuen Wang, and Hsiang-Yun Wu. Mixed metro maps with user-specified motifs. In *Poster Proceedings of the 29th International Symposium on Graph Drawing and Network Visualization*, Tübingen, Germany, September 2021.

[IP2] Elitza Vasileva and Hsiang-Yun Wu. Optiroute: Interactive maps for wayfinding in a complex environment. In *Poster Proceedings of the 2nd Schematic Mapping Workshop*, Vienna, Austria, April 2019. [Best Poster Award].

[IP3] Hsiang-Yun Wu, Ken Maruyama, Takamasa Kawagoe, Kazuo Misue, Masatoshi Arikawa, and Shigeo Takahashi. Aspect-ratio-preserved labeling on metro maps. In *Poster Proceedings of the 2nd Schematic Mapping Workshop*, Vienna, Austria, April 2019.

[IP4] Hsiang-Yun Wu, Martin Nöllenburg, and Ivan Viola. A visual comparison of hand-drawn and machine-generated human metabolic pathways. In *Poster Proceedings of 20th EG/VGTC Conference on Visualization (EuroVis2018)*, Brno, Czech, June 2018.

[IP5] Naoko Sawada, Masanori Nakayama, Hsiang-Yun Wu, Makoto Uemura, and Issei Fujishiro. Timetubes: Visual fusion for detailed and precise analysis of time-varying multi-dimensional datasets. In *Poster Proceedings of the International Meeting on High-Dimensional Data Driven Science (HD3-2017)*, Kyoto, Japan, December 2017.

[IP6] Naoko Sawada, Masanori Nakayama, Hsiang-Yun Wu, Makoto Uemura, and Issei Fujishiro. Timetubes: Visual fusion for ameliorating uncertainty of blazar datasets from different observatories. In *Poster Proceedings of the 10th IEEE Pacific Visualization Symposium (PacificVis2014)*, Seoul, Korea, April 2017.

[IP7] Shigeo Takahash, Hsiang-Yun Wu, Masatoshi Arikawa, and Sheung-Hung Poon. Optimized displacement and selection in scale-aware map editing. In *Poster Proceedings of the IEEE VIS Conference*, Baltimore, USA, November 2016.

[IP8] Hsiang-Yun Wu, Shigeo Takahash, Masatoshi Arikawa, and Sheung-Hung Poon. Consistent placement of labels with different scale ranges. In *Poster Proceedings of the IEEE VIS Conference*, Baltimore, USA, November 2016.

[IP9] Longyin Xu, Masanori Nakayama, Hsiang-Yun Wu, Makoto Uemura, and Issei Fujishiro. Timetubes: Preliminary design of visualization tool for timedependent, multivariate blazar datasets. In *Poster Proceedings of the International Meeting on High-Dimensional Data Driven Science (HD3-2015)*, Kyoto, Japan, December 2015.

[IP10] Yusuke Niibe, Hsiang-Yun Wu, Kazuho Watanabe, Shigeo Takahashi, and Issei Fujishiro. Making many-to-many parallel coordinate plots scalable by asymmetric biclustering. In *Poster Proceedings of the International Meeting on High-Dimensional Data Driven Science (HD3-2015)*, Kyoto, Japan, December 2015.

[IP11] Yi Gao, Hsiang-Yun Wu, Kazuyo Mizuno, Kazuo Misue, and Shigeo Takahashi. Visualizing bag-of-features image categorization using anchored maps. In *Poster Proceedings of the 7th IEEE Pacific Visualization Symposium (PacificVis2014)*, pages 47–48, Yokohama, Japan, March 2014.

[IP12] Hsiang-Yun Wu, Shigeo Takahashi, Chun-Cheng Lin, and Hsu-Chun Yen. Designing octilinear layouts for customized metro maps. In *Poster Proceedings of the 5th IEEE Pacific Visualization Symposium (PacificVis2012)*, Songdo, Korea, March 2012.

[IP13] Hsiang-Yun Wu, Shigeo Takahashi, Chun-Cheng Lin, and Hsu-Chun Yen. A genetic-based method for external labeling on metro maps. In *Poster Proceedings of the 4th IEEE Pacific Visualization Symposium (PacificVis2011)*, pages 27–28, Hong Kong, China, March 2011.

International Contests:

[IS1] Hsiang-Yun Wu. The world of scientists. 24-Hour Science Map Contest, December 2021. https://24hoursciencemap.info, [1rd Place Award].

[IS2] Markus Wallinger and Hsiang-Yun Wu. K-pop hive. In *The 29th Annual Graph Drawing Contest (GD2020)*, Vancouver, Canada, September 2020. [3rd Place Award at GD2020].

[IS3] Hsiang-Yun Wu Martin Nöllenburg and Ivan Viola. Map of metabolic harmony. In *Proceedings of the 9th Eurographics Workshop on Visual Computing for Biology and Medicine (VCBM2019)*, Brno, Czech Republic, September 2019.

[IS4] Guangping Li, Soeren Nickel, Martin Nöllenburg, Ivan Viola, and Hsiang-Yun Wu. World map of recipes. In *The 28th Annual Graph Drawing Contest (GD2019)*, Prague, Czech Republic, September 2019. [1st Place Award at GD2019].

[IS5] Hsiang-Yun Wu Martin Nöllenburg and Ivan Viola. The travel of a metabolite. In *Visual Data Storytelling Contest of 11th IEEE Pacific Visualization Symposium (PacificVis2018)*, Kobe, Japan, April 2018.