

Denis Parra

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Research Group: Head of the Human-Centered AI and Visualization group (HAIVis) <https://haivis.ing.puc.cl>

Faculty Member of the Artificial Intelligence Lab (IALab) <https://ialab.ing.puc.cl/>

Interests

Recommender Systems, Applications of Machine Learning on Clinical Diagnosis and Creativity, Data Visualization.

Education

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| 2008-2013 | University of Pittsburgh , Pittsburgh, PA, USA
PhD in Information Science. Adviser: Professor Peter Brusilovsky |
| 2002-2004 | Universidad Austral de Chile , Valdivia, Chile
Professional title of Civil Engineer in Informatics. |
| 1997-2002 | Universidad Austral de Chile , Valdivia, Chile
Bachelor of Engineering Sciences. |

Academic Awards and Honors

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| 2019 | Candidate best paper honorable mention , IUI 2019 conference, Los Angeles, CA, USA. |
| 2018 | Candidate best paper honorable mention , IUI 2018 conference, Tokyo, Japan. |
| 2017 | Outstanding reviewer award , WWW 2017 conference, Perth, Australia. |
| 2011 | Best student paper award , User Modelling, Adaptation and Personalization (UMAP) 2011 conference. Girona, Spain. |
| 2008 | BIO-Fulbright Scholarship , to pursue doctoral studies in the United States. |

Projects

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| 2023-2025 | Leading Researcher in Fondecyt Project 1231714 “ Multimodal, multitask and transfer learning for deep radiological report generation ”. ANID. |
| 2021-2031 | Principal Researcher at Millenium Institute (iHealth), funded by ANID. |
| 2021-2031 | Associate Researcher at National Center for Artificial Intelligence (CENIA), funded by ANID. |
| 2018-2028 | Adjunct Researcher at Millenium Institute for Research on Fundamentals of Data (IMFD) , funded by ANID. |
| 2019-2021 | Leading Researcher in Fondecyt Project 1191791 “ Harnessing Information Visualization and Interactivity to Develop Interfaces for Explainable AI ”. CONICYT. |
| 2016-2018 | Associate Researcher in Fondef IDEa Project ID16I10222 “ Observatorio Digital de Delincuencia en Chile: Un sistema inteligente de apoyo a la industria automotriz chilena ”. CONICYT. |
| 2016-2018 | Leading Researcher in Fondecyt Initiation Project 11150783 “ Dealing with Information Overload Using Intelligent Recommender System Interfaces ”. CONICYT. |
| 2015-2016 | Co-PI in project “ Visualization and Recommendation of Large Image and Text Collections toward Effective Sensemaking ”. PUC Chile-Notre Dame collaboration. PI: Prof. Chaoli Wang, University of Notre Dame. |
| 2014-2017 | Researcher in project “ Nucleo milenio research center for entrepreneurial strategy under uncertainty (NS130028) ”, PI: Prof. Stephen Zhang, PUC Chile. |

Students Supervised

PhD	[PhD student] Oscar Loch (2023 -)
	[PhD student] Ivania Donoso (2021 -) “A comprehensive framework for understanding the user experience with Explainable AI systems”
	[PhD Candidate] Pablo Messina “Text report generation from X-Rays via VQA modelling”
	[Graduated 2023] Manuela Garretón “The Impact of Information Visualization in Public Policy”
	[Graduated 2022] Andrés Carvallo, working on thesis “Active Learning for Evidence-Based Medicine”.
	[Graduated 2019] José Miguel Herrera, thesis title “Learning to Rank Social Knowledge for Question Answering in Streaming Platforms”.
Master	[Graduated 2022] Pablo Pino, thesis: “Report generation from chest X-Rays: analysis of NLP metrics and clinically correct template-based model”.
	[Graduated 2021] Manuel Cartagena, thesis: “Exploring Symbolic Music Generation Techniques Using Conditional Generative Adversarial Networks”.
	[Graduated 2021] Hernán Valdivieso, thesis: “Desarrollo y Evaluación de un Modelo De Diseño de Visualizaciones para Inteligencia Artificial Explicable”.
	[Graduated 2021] Antonio Ossa, thesis: “Design of a framework to build explainable recommendation systems using visual concepts”.
	[Graduated 2020] Tamara Covacevich, thesis: “Exploring Representations Of ICD Codes For Patient Readmission Prediction”.
	[Graduated 2019] Pablo Messina, thesis: “Algorithms for Visual Art Recommendation: Leveraging Visual Features, Metadata and Implicit Feedback”. Master thesis published in UMuAI Journal.
	[Graduated 2019] Vicente Domínguez, thesis: “Studying the Effects of Explaining Recommendations of Artistic Images”. Thesis research published as full paper at ACM IUI Conference (nominated to best paper), 3 workshop publications at ACM RecSys conference.
	[Graduated 2019] María Fernanda Sepúlveda, thesis: “Herramientas de Analítica Visual para Modelos de Tópicos Sobre Colecciones de Documentos”.
	[Graduated 2019] Jorge Schellman, thesis: “Evaluación de Diversas Metodologías para Recomendación de Libros”.
	[Graduated 2019] Lukas Svcarovic, thesis: “Evaluación de Técnicas de Interacción para Comparación de Mapas de Densidad Multiclase”.
	[Graduated 2017] Ivania Donoso-Guzmán, thesis: “Design and Evaluation of an Intelligent User Interface in Evidence Based Health Care”. Two full papers at ACM IUI Conference, both nominated to best paper.

Journal Publications

2023	[WoS] Garretón, M., Morini, F., Moyano, D. P., Grün, G. C., Parra, D., & Dörk, M. (2023). <i>Data Stories of Water: Studying the Communicative Role of Data Visualizations within Long-form Journalism</i> . In COMPUTER GRAPHICS forum (Vol. 42, No. 3), [https://doi.org/10.1111/cgf.14815]
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- [WoS] Garretón, M., Morini, F., Celhay, P., Dörk, M., & Parra, D. (2023). *Attitudinal effects of data visualizations and illustrations in data stories*. IEEE Transactions on Visualization and Computer Graphics, [https://doi.org/10.1109/TVCG.2023.3248319]
- [WoS] Araneda-Hernandez, M., Bravo-Marquez, F., Parra, D., & Cádiz, R. F. (2023). *MUSIB: musical score inpainting benchmark*. EURASIP Journal on Audio, Speech, and Music Processing, 2023(1), 19, [https://doi.org/10.1186/s13636-023-00279-6]
- 2022 [WoS] Pablo Messina, Pablo Pino, Denis Parra, Alvaro Soto, Cecilia Besa, Sergio Uribe, Marcelo Andía, Cristian Tejos, Claudia Prieto, Daniel Capurro. *A survey on deep learning and explainability for automatic report generation from medical images*. ACM Computing Surveys [https://doi.org/10.1145/3522747]
- 2021 [WoS] Diego Rojo, Nyi-Nyi Htun, Denis Parra, Robin De Croon, Katrien Verbert. *AHMoSe: A knowledge-based visual support system for selecting regression machine learning models*. Computers and Electronics in Agriculture [https://doi.org/10.1016/j.compag.2021.106183]
- [WoS] Rodrigo Cádiz, Agustin Macaya, Manuel Cartagena, Denis Parra. *Creativity in Generative Musical Networks: Evidence From Two Case Studies*. Frontiers in Robotics and AI, 229
- 2020 [WoS] Vicente Dominguez, Ivania Nadine Donoso-Guzmán, Pablo Messina, and Denis Parra. *Algorithmic and HCI aspects for explaining recommendations of artistic images*. ACM Transactions on Interactive Intelligent Systems 0, [https://doi.org/10.1145/3369396]
- [WoS] José Herrera, Denis Parra, Barbara Poblete. *Social QA in non-CQA platforms*. Future Generation Computer Systems [https://doi.org/10.1016/j.future.2019.12.023]
- 2019 [WoS] José Méndez, Hans Lobel, Denis Parra, Juan Carlos Herrera. *Using Twitter to Infer User Satisfaction with Public Transport: the case of Santiago, Chile*. IEEE Access, [https://doi.org/10.1109/ACCESS.2019.2915107]
- [WoS] Yi-ling Lin, Denis Parra, Christoph Trattner, Peter Brusilovsky. *Tag-based information access in image collections: insights from log and eye-gaze analyses*. Knowledge and Information Systems, 1–28, [http://doi.org/10.1007/s10115-019-01343-4].
- 2018 [WoS] Pablo Messina, Vicente Dominguez, Denis Parra, Christoph Trattner, and Alvaro Soto. *Content-based artwork recommendation: integrating painting metadata with neural and manually-engineered visual features*. User Modeling and User-Adapted Interaction, [https://doi.org/10.1007/s11257-018-9206-9]
- [WoS] Wai Lam Jonathan Lee, Denis Parra, Jorge Munoz-Gama, Marcos Sepúlveda. *Predicting Process Behavior Meets Factorization Machines*. Expert Systems with Applications, [https://doi.org/10.1016/j.eswa.2018.05.035].
- [WoS] Ivana Andjelkovic, Denis Parra, John O'Donovan. *Moodplay: Interactive music recommendation based on Artists' mood similarity*. International Journal of Human-Computer Studies. [https://doi.org/10.1016/j.ijhcs.2018.04.004]
- [WoS] Bruno Cardoso, Gayane Sedrakyan, Francisco Gutiérrez, Denis Parra, Peter Brusilovsky, Katrien Verbert. *IntersectionExplorer, a multi-perspective approach for exploring recommendations*. International Journal of Human-Computer Studies [https://doi.org/10.1016/j.ijhcs.2018.04.008].
- Christoph Trattner, Alexander Oberegger, Leandro Balbi-Marinho, Denis Parra. *Investigating the utility of the weather context for point of interest recommendations*. Journal on Information Technology & Tourism. [https://doi.org/10.1007/s40558-017-0100-9]
- 2017 [WoS] Vanessa Peña-Araya, Mauricio Quezada, Bárbara Poblete, Denis Parra. *Gaining historical and international relations insights from social media: spatio-temporal real-world news analysis using Twitter*. EPJ Data Science [https://doi.org/10.1140/epjds/s13688-017-0122-8]

- [WoS] Christoph Trattner, Denis Parra, David Elswiler, **Monitoring obesity prevalence in the United States through bookmarking activities in online food portals**, PloS One, [https://doi.org/10.1371/journal.pone.0179144]
- 2016 [WoS] Katrien Verbert, Denis Parra, Peter Brusilovsky, **Agents vs. Users: Visual Recommendation of Research Talks with Multiple Dimensions of Relevance**, ACM Transactions on Interactive Intelligent Systems, ACM, [https://doi.org/10.1145/2946794]
- [WoS] Chen He, Denis Parra, Katrien Verbert, **Interactive recommender systems: a survey of the state of the art and future research challenges and opportunities**, Expert Systems with Applications, Elsevier [http://dx.doi.org/10.1016/j.eswa.2016.02.013]
- [WoS] Peter Brusilovsky, Jung Sun Oh, Claudia Lopez, Denis Parra, Wei Jeng, **Linking Information and People in a Social System for Academic Conferences**. New Review of Hypertext and Hypermedia, Taylor and Francis [http://dx.doi.org/10.1080/13614568.2016.1179796]
- [WoS] Mar Pérez-Sanagustin, Denis Parra, Renato Verdugo, Gonzalo García-Galleguillos, Miguel Nussbaum, **Using QR codes to increase user engagement in museum-like spaces**, Computers in Human Behavior, Elsevier [http://dx.doi.org/10.1016/j.chb.2016.02.012]
- [WoS] Yi Gu, Chaoli Wang, Jun Ma, Robert J Nemiroff, David L Kao, Denis Parra, **Visualization and recommendation of large image and text collections toward effective sensemaking**, Information Visualization, SAGE Publications [http://dx.doi.org/ 10.1177/1473871616630778]
- [WoS] Denis Parra, Christoph Tratter, Diego Gomez, Matias Hurtado, Xidao Wen, Yu-Ru Lin, **Twitter in academic events: A study of temporal usage, communication, sentimental and topical patterns in 16 Computer Science conferences**, Computer Communications [http://dx.doi.org/10.1016/j.comcom.2015.07.001]
- 2015 [WoS] Denis Parra, Peter Brusilovsky, **User-controllable personalization: A case study with SetFusion**, Int. J. Human-Computer Studies [http://dx.doi.org/10.1016/j.ijhcs.2015.01.007]
- 2011 Troussov, A., Darena, F., Žizka, J., Parra, D., Brusilovsky, P. **Vectorised Spreading Activation Algorithm for Centrality Measurement**. Acta Universitatis agriculturae et silviculturae Mendelianae Brunensis. 2011. sv. LIX, no. 7, s. 469--476. ISSN 1211-8516

Selected Conference and Workshop Papers

- 2024 Pablo Messina, René Vidal, Denis Parra, Álvaro Soto, Vladimir Araujo. 2024. **Extracting and Encoding: Leveraging Large Language Models and Medical Knowledge to Enhance Radiological Text Representation**. In Findings of the Association for Computational Linguistics ACL 2024.
- Álvaro Labarca-Silva, Denis Parra, and Rodrigo Toro Icarte. 2024. **On the Unexpected Effectiveness of Reinforcement Learning for Sequential Recommendation**. In Forty-first International Conference on Machine Learning ICML 2024.
- 2023 Júlio B. G. Costa, Leandro B. Marinho, Rodrygo L. T. Santos, and Denis Parra. 2023. **Evaluating Pre-training Strategies for Collaborative Filtering**. In Proceedings of the 31st ACM Conference on User Modeling, Adaptation and Personalization (UMAP '23). 175–182.
- 2022 Pablo Messina, José Cañete, Denis Parra, Alvaro Soto, Cecilia Besa, Jocelyn Dunstan. 2022. **Two-stage Conditional Chest X-ray Radiology Report Generation**. MedNeurips Workshop 2022.
- Leandro B. Marinho, Júlio Barreto Guedes da Costa, Denis Parra, Rodrygo LT Santos. 2022. **Evaluating Interactive Comparison Techniques in a Multiclass Density Map for Visual Crime Analytics**. In Proceedings of the 27th International Conference on Intelligent User Interfaces Companion.
- Vladimir Araujo, Helem Salinas, Alvaro Labarca, Andres Villa, Denis Parra. 2022. **Hierarchical Transformers for Group-Aware Sequential Recommendation: Application in MOBA Games**.

Adjunct Proceedings of the 30th ACM Conference on User Modeling, Adaptation and Personalization.

- 2021 Lukas Svicarovic, Denis Parra, María J. Lobo. ***Evaluating Interactive Comparison Techniques in a Multiclass Density Map for Visual Crime Analytics***. EuroVis 2021.
- Pablo Pino, Denis Parra, Cecilia Besa, Claudio Lagos. ***Clinically Correct Report Generation from Chest X-Rays Using Templates***. International Workshop on Machine Learning in Medical Imaging (MLMI), co-located at MICCAI 2021.
- 2020 Agustin Macaya, Rodrigo Cadiz, Manuel Cartagena, Denis Parra. 2020. ***Latent Chords: Generative Piano Chord Synthesis with Variational Autoencoders***. In Proceedings of the Workshop on Human-AI Co-Creation with Generative Models (HAI-GEN).
- 2019 Vicente Domínguez, Pablo Messina, Ivania Donoso-Guzmán, Denis Parra. 2019. ***The Effect of Explanations and Algorithmic Accuracy on Visual Recommender Systems of Artistic Images***. In Proceedings of the 24th International Conference on Intelligent User Interfaces Companion. (Nominated to best paper award)
- 2018 Ivania Donoso-Guzmán, Denis Parra. 2018. ***An Interactive Relevance Feedback Interface for Evidence-Based Health Care***. In Proceedings of the 23rd International Conference on Intelligent User Interfaces Companion. (Nominated to best paper award)
- José Miguel Herrera, Bárbara Poblete, Denis Parra. 2018. ***Learning to Leverage Microblog Information for QA Retrieval***. In Proceedings of the European Conference on Information Retrieval.
- 2017 Katrien Verbert, Peter Brusilovsky, Chirayu Wongchokprasitti, Denis Parra, and Bruno Cardoso. 2017. ***Supporting Conference Attendees with Visual Decision Making Interfaces***. In Proceedings of the 22nd International Conference on Intelligent User Interfaces Companion.
- Manuela Garretón, Karina Hyland, Denis Parra. 2017. ***Understanding People's Interaction with Neural Sci-Art***. Proceedings of the Visual Arts Program, IEEE Visualization Conference.
- 2016 Ivana Andjelkovic, Denis Parra, John O'Donovan. ***Moodplay: Interactive Mood-based Music Discovery and Recommendation***. In proceedings of the Conference on User Modeling, Adaptation and Personalization 2016, Halifax, Canada.
- 2015 Alfredo Cobo, Denis Parra, Jaime Navón. ***Identifying Relevant Messages in a Twitter-based Citizen Channel for Natural Disaster Situations***. In proceedings of the 3rd Workshop on Social Web for Disaster Management, co-located at the 24th International World Wide Web Conference 2015, Florence, Italy.
- 2014 Denis Parra, Peter Brusilovsky, and Christoph Trattner. 2014. ***See what you want to see: visual user-driven approach for hybrid recommendation***. In Proceedings of the 19th international conference on Intelligent User Interfaces (IUI '14). ACM, New York, NY, USA, 235-240
- 2013 Katrien Verbert, Denis Parra, Peter Brusilovsky and Erik Duval. ***Visualizing Recommendations to Support Exploration, Transparency and Controllability***. 18th ACM Conference In Intelligent User Interfaces, CA, USA, March 19-22
- 2012 Christoph Trattner, Yi-Ling Lin, Denis Parra, Zhen Yue and Peter Brusilovsky. ***Evaluating Tag-Based Information Access in Image Collections***. 23rd ACM Conference on Hypertext and Adaptive Hypermedia. Milwaukee, WI, USA, June 25-28. (Nominated to best paper award)
- 2011 Denis Parra, Xavier Amatriain. ***Walk the Talk: Analyzing the Relation between Implicit and Explicit Feedback for Preference Elicitation***. UMAP 2011, Girona, Spain. (Best student paper award)
- 2009 D. Parra, P. Brusilovsky, ***Collaborative Filtering for Social Tagging Systems: an Experiment with CiteULike***. RecSys 2009, New York, NY, USA

Book Chapters

- 2012 Denis Parra, Shaghayegh Sahebi. **Chapter 8, Recommender Systems: Sources of Knowledge and Evaluation Metrics**. Advanced Techniques in Web Intelligence, Volume 2, Springer-Verlag. Editors: Juan D. Velásquez, Vasile Palade and Lakhmi C. Jain.

Invited Talks

- 2023 **Can visual narratives influence attitudes and emotions on people?** Future week 2023 (Bergen, Norway)
- Research at Chile's iHealth Millenium Institute and Progress on Radiological Report Generation**, Research seminar (U. of Nottingham, UK)
- 2022 **From Transparency and Users' Control in Recommender System Interfaces to Guidelines for Visual XAI**, Apex-IUI workshop, co-located at ACM IUI 2022 (Helsinki, Finland)
- From User Control and Explainability in Recommendation Interfaces to Visual XAI**, IntRS workshop, co-located at ACM RecSys 2022 (Seattle, WA, USA)
- Invited tutorial “A gentle tutorial on NLG for Medical Applications”**, SIPAIM 2022 (Santiago, Chile)
- Visual XAI: The road from Explainability and User Control in Recommendation Interfaces to**, International Autumn School on Situation Awareness in Cognitive Technologies 2022 (Orlando, FL, USA)
- From Explainable Recommendation Systems to Visual Explainable AI: Lessons and Open Challenges**, Theses and Dissertations Workshop in Computer Science (WTDCC) of the Universidade Federal de Uberlândia (Uberlandia, Brasil)

Teaching Experience

- 2024-... **Introduction to Programming**. PUC Chile. Taught at 1st term each year.
- 2014-... **Recommender Systems**, graduate course. PUC Chile. Taught 1st and 2nd term each year.
- 2017-2019 **Information Visualization**, PUC Chile, Taught at 2nd term each year.
- 2014-2021 **Introduction to the Major of Computer Science**. PUC Chile. Taught 1st term each year.
- 2014-2017 **Data Mining**, graduate course, MPGI master program. PUC Chile. Taught at 1st term each year.
- 2006-2007 **Software Engineering (UML)**. Universidad Austral de Chile. Taught for two terms.
- Introduction to Programming (Java)**. Universidad Austral de Chile. Taught for one term.
- 2003-2004 **Introduction to Programming (Java)**. Universidad Austral de Chile. Taught for four terms.
- 2004 **Seminar on Multiagent Systems (Java)**. Universidad Austral de Chile. Taught for one term.

Professional and Research Experience

- 09/23-12/24 **Consulting on Large Language Models**. Multiplex BioEngineering. Contact: Pablo Garcés (pablo@goplaceit.com)
- 06/19-12/20 **Consulting on Deep Neural Recommendation Systems**. Real State online company GoPlaceIT. Contact: Pablo Espinace (pablo@goplaceit.com)

- 06/10-09/10 **Research Internship on Implicit Feedback for Recommender Systems.** Telefonica Research & Development, Barcelona. Research Tutor: Dr. Xavier Amatriain (currently CTO Cure.ai)
- 06/09-09/09 **Research internship on Spreading Activation Methods.** KDEG lab at Trinity College Dublin and IBM Dublin. Research tutor: Dr. Alexander Trousoff.
- 06/07-12/08 **Co-founder and Project Manager at Perceptum TI,** www.perceptum.cl, Valdivia, Chile
- 02/05-12/07 **IT Consultant, Cards Aquaculture Services,** Puerto Montt, Chile
- Elicitation of hardware acquisition, project manager of software development.
- 07/03-01/04 **Software Analyst and Programmer, Universidad Austral de Chile,** Valdivia, Chile
- Design and development of a Learning Management System. (PHP/MySQL)
 - Implementation of a web search engine for Chilean research information (PHP, SQLServer)
- 01/02-03/02 **Professional internship, Software Developer. DMR Consulting,** Santiago, Chile
- Design and development of an Intranet for management of documentation related to Enterprise Application Integration projects (ASP/ SQL Server)
- 01/01-03/01 **Professional internship, Software Developer. Centro Informático UACH,** Valdivia, Chile
- Design and development of a tourism information system for SERNATUR, National Service of Tourism (PHP, Perl, PostgreSQL)

Academic service: Reviewing Activities/ Program Committee

- 2024 Program co-chair of the ACM Intelligent User Interfaces conferences, to be held in NC, USA.
Reviewer at the journal ACM Transactions in Interactive and Intelligent Systems
Senior PC member at ACM RecSys conference
- 2023 Reviewer at the journal ACM Transactions in Interactive and Intelligent Systems
Senior PC member at ACM RecSys conference
Senior PC member of ACM IUI conference
Reviewer at the IEEE Vis workshop on Visualization for Explainable AI (VisXAI)
- 2022 Reviewer at the journal ACM Transactions in Interactive and Intelligent Systems
Senior PC member at ACM RecSys conference
Senior PC member of ACM IUI conference
PC member of The Web Conference (former World Wide Web Conference)
Reviewer at the IEEE Vis workshop on Visualization for Explainable AI (VisXAI)
- 2021 Reviewer at the journal ACM Transactions in Interactive and Intelligent Systems
Senior PC member at ACM RecSys conference
Senior PC member of ACM IUI conference
Senior PC member of SIGIR conference
PC member of The Web Conference (former World Wide Web Conference)
- 2020 Reviewer at the journal ACM Transactions in Interactive and Intelligent Systems
Senior PC member at ACM RecSys conference
Senior PC member of ACM IUI conference
Senior PC member of SIGIR conference
PC member of IJCAI Conference
PC member of CHI Conference
PC member of The Web Conference (former World Wide Web Conference)
PC member of the Visualization in Data Science Symposium, at IEEE Vis
PC member of UMAP conference
- 2019 Senior PC member at ACM RecSys 2019 conference
PC member of ACM IUI conference
PC member of The Web Conference (former World Wide Web Conference)
PC member of UMAP conference

PC member of IJCAI conference

2018

Senior PC member at ACM RecSys 2018 conference

PC member of ACM IUI conference

PC member of The Web Conference (former World Wide Web Conference)

Distinguished reviewer at the ACM TiiS journal

Reviewer at IJHCS journal

2017

PC member of the CIKM 2017 conference

PC member of the ACM RecSys 2017 conference

PC member of the Transactions on Interactive and Intelligent Systems, ACM.

PC member of 26th International World Wide Web Conference on the (WWW 2017)

PC member of ACM SAC Conference 2017.