DANIELA OPITZ

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RESEARCH INTERESTS

My research is situated at the intersection of human mobility and data science, with a specific emphasis on leveraging machine learning techniques to address challenges in transportation planning. I utilize advanced computational approaches to analyze mobility patterns and enhance transportation systems. Additionally, I have a strong interest in the field of computer vision and in applying data science for social well-being. In the academic realm, I have taught courses in Introduction to Programming in Python, Introduction to Computer Vision, and Information Visualization. My prior experience includes reasearch in astronomy, specifically in image processing and the study of star motion.

EDUCATION

2018 **Ph.D. in Physics**, University of New South Wales, Australia
Thesis: Imaging and Astrometry for the Coolest Brown Dwarfs
Advisor: Dr. Christopher Tinney

2011 **B.Sc. in Astronomy**, University of Chile

PROFESSIONAL APPOINTMENTS

2020 - 2024 **Assistant Professor**
Instituto Data Science, Universidad del Desarrollo

2018 - 2019 **R&D Researcher**
Instituto Data Science, Telefónica R&D - Universidad del Desarrollo

2017 **Data Analyst**
Direction of Information Technologies and Communication, University of Chile

FUNDING AND AWARDS

Research Grants

2022 - 2024 ANID-Fondecyt de Iniciación, **11220799**
Leaving no one behind: measuring digital inequalities using mobile phone records
Principal Investigator

2022 - 2023 Fondo de Innovación para la Competitividad Regional (FIC-R), **40043796-0**
Digital management of mobility for the city
Principal Investigator

2020 - 2022 ANID-Subvención a Instalación en la Academia, **PAI77190057**
Strengthening of research and teaching in data science in the area of smart cities, top-ranked
Principal Investigator

2020 Severo Ochoa Mobility grant
To visit the Barcelona Supercomputing Center

2013 - 2017 Ph.D top-up scholarship, UNSW Exoplanetary Science Group

2012 - 2017 ANID-Becas Chile fellowship

Telescope Proposals

2016 **Opitz, D.**, Tinney, C. G., Faherty, J. & Gelino, C. GS-2016B-C-2
Astrometry and Binarity of WISE Y dwarfs with MCAO Gemini South, GEMS–GSAOI

2015 **Opitz, D.**, Tinney, C. G., Faherty, J. & Gelino, C. GS-2015B-Q-47
Astrometry and Binarity of WISE Y dwarfs with MCAO Gemini South, GEMS-–GSAOI

Awards

2014 Best student poster, Second Chilean Graduate Student Conference, Australia

2014 Best student poster, The Astronomical Society of Australia Annual Meeting

2009 - 2010 Claudio Vicuña award, University of Chile

2007 - 2009 Moisés Mellado award, University of Chile

2004 - 2010 Bicentenario scholarhip, Government of Chile

PUBLICATIONS

Refereed Publications

2023 Graells-Garrido, E., **Opitz, D.**, Rowe, F & Arriagada, J. A data fusion approach with mobile phone data for updating travel survey-based mode split estimates *Transport Research Part C: Emerging Technologies*
https://doi.org/10.1016/j.trc.2023.104285

2022 Graells-Garrido, E., Shifanella R. **Opitz, D.** & Rowe, F. Measuring the Local Complementarity of Population, Amenities and Digital Activities to Identify and Understand Urban Areas of Interest. *Environment and Planning B: Urban Analytics and City Science, 50(4), 942-957*
https://doi.org/10.1177/23998083221117830

2020 **Opitz, D.**, Graells-Garrido, E., & Pérez-Messina, I. Toward Characterizing Cities with Social Media Images Using Activity Recognition, Topic Modeling and Visualization. *In Companion Proceedings of the Web Conference 2020 (pp. 688-693).*
https://doi.org/10.1145/3451964.3451972

2016 **Opitz, D.**, Tinney, C., Faherty, J., Sweet, S., Gelino, C. & Kirkpatrick J. D. Searching for Binary Y Dwarfs with the Gemini Multi-conjugate Adaptive Optics System (GeMS). *The Astrophysical Journal, 819(1), 17.*
https://doi.org/10.3847/0004-637X/819/1/17

2011 **Opitz, D.** & Gallardo, J. Lithium Depletion Boundary Under Rotation And Spots Coverage. *Boletin de la Asociacion Argentina de Astronomia La Plata Argentina, 54, 93-96.*

Manuscripts Under Review

2024 **Opitz, D.**, Graells-Garrido, E., Arriagada, J., Rivas, M. & Meza, N. e-Scooter Effects on Public Transport Demand: A Case Study in Santiago, Chile. *Transport Research Part D*

2024 Cotton, D., Bailey J., Kedziora-Chudczer, L., Bott, K., De Horta, A., Filcek, N., Marshall, J., Melville, G., Buzasi, D., Boiko, I., Borsato, N., Perkins, J., **Opitz, D.**, et al. Polarization Position Angle Standard stars: a Reassessment of θ and its Variability for Seventeen Stars Based on a Decade of Observations. *Monthly Notices of the Royal Astronomical Society*, **Accepted with minor revisions**

Conference Proceedings

2022 Urrejola, S., Del Campo-Smith, M., Duran, E., Asahi, T., **Opitz, D.** & Lobos, L. Scratch Assay Image Analysis Automation. *26th UK Conference on Medical Image Understanding and Analysis.*

2015 **Opitz, D.** & Tinney, C. Searching for Binary Y dwarfs with the Gemini Multi-Conjugate Adaptive Optics System. *IAU General Assembly, 22, 2241608.*

2014 **Opitz, D.** & Tinney, C. Searching for Binary Y dwarfs with the Gemini Multi-Conjugate Adaptive Optics System. *Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, 18, 1027.*

Other Publications

2023 Graells-Garrido, E. & **Opitz, D.** La ciudad a vuelo de pájaro: ciencia de datos para planificación urbana. *Bits de Ciencia, 24, 9-14*
https://www.dcc.uchile.cl/difusion/revista/24

TALKS

2024 *Bikeway Planning: The Role of Mobile Phone Data.* Urban Beers, Santiago, Chile.

2023 *Gestión Digital de la Movilidad para la Ciudad.* Metropolitan Regional Council (GORE), Santiago, Chile.

2023 *Gestión Digital de la Movilidad para la Ciudad.* Closing event for the FIC-R project, Santiago, Chile.

2023 *PLUMAS: Urban platform of mobility, analysis and simulation.* Barcelona Supercomputing Center 2023, Barcelona, Spain.

2020 *Toward characterizing cities with social media images.* The Web Conference 2020, Taipei, Taiwan.

2018 *From astronomy to data science.* Universidad de Chile, Santiago, Chile.

2017 *Measuring distances to the coolest stars with adaptive optics.* Chile Wic, Woman In Computing, Santiago, Chile.

2017 *Imaging and astrometry for the coolest stars (Invited).* II Chilean Gemini Users Meeting & Workshop, La Serena, Chile.

2015 *Searching for binary Y dwarfs with GeMS.* The 2015 Australian Gemini, Magellan, and Keck Science Symposium, Sydney, Australia.

2011 *Lithium depletion boundary under rotation and spots coverage.* I Annual Meeting Between The Chilean Astronomical Society and The Argentinian Astronomical Association, San Juan, Argentina.

TECHNOLOGY TRANSFER

2024	*Aves*: a Python library for Analysis, Visualization, Education, and Support
2023	*Digital management of mobility for the city*: a visualization tool for urban mobility based on mobile phone records. Metropolitan Regional Government (GORE)
2022	*SpotPaySolutions*: estimation of potential new payment points using transaction data and machine learning algorithms. Transbank.
2020 - 2022	*Metamobility*: characterization of users using mobile phone records and machine learning models. Telefónica Tech.
2019	*AI Readiness, diagnosis of adoption of AI in companies.* AmCham Chile.
2018	*Smart-agro*: characterization of agriculture crops using multi-spectral images and computer vision algorithms. Telefónica Tech.

TEACHING EXPERIENCE

2023 - 2024	Visualization of Information	Universidad del Desarrollo
2019 - 2023	Introduction to Programming	Universidad del Desarrollo
2018 - 2020	Introduction to Computer Vision	Universidad del Desarrollo
2019	Introduction to Python	Telefónica Tech

SUPERVISION

Research Assistance

2023-2024	Natalia Meza, *Tools for processing and analyzing BIP transaction data*, University of Chile
2023-2024	Matilde Rivas, *Aves: analysis, and visualization.*
2023	Cesar Marín, *Digital management of mobility for the city*, Data Science Institute, Universidad del Desarrollo
2022 - 2023	Daniela Campos, *Digital management of mobility for the city*, Data Science Institute, Universidad del Desarrollo.

Master of Science

Expected 2024	Sebastián Olmos, Superfly: System for visualizing multivariate mobility flows in a city, Master of Science in Computer Science, University of Chile

Master of Professional Studies

2024	Claudio Gaete, *Geographical lifetime value for Transbank*, Master in Data Science, Universidad del Desarrollo.
2024	Camila Soto, *Geographical lifetime value for Transbank*, Master in Data Science, Universidad del Desarrollo.
2023	Felipe Guzmán, *Estimation of public transport demand using machine learning methods*, Master in Data Science, Universidad del Desarrollo.
2023	Effry Vigorena, *Estimation of public transport demand using machine learning methods*, Master in Data Science, Universidad del Desarrollo.
2023	Fabian Nova, *Assessing travel time changes with the introduction of a new metro station*, Master in Data Science, Universidad del Desarrollo.
2023	Wilder Prado, *Assessing travel time changes with the introduction of a new metro station*, Master in Data Science, Universidad del Desarrollo.
2023	Fernando Nachbauer, *Impact of crimes on economic activity*, Master in Data Science, Universidad del Desarrollo.
2023	Javier Zacarias, *Impact of crimes on economic activity*, Master in Data Science, Universidad del Desarrollo.
2023	Jorge Adrián Fernandez, *Detection of globular cluster sequences in Virgo*, Master in Data Science, Universidad del Desarrollo
2022	Sebastián Urrejola, *Scratch assay image analysis automation*, Master in Data Science, Universidad del Desarrollo.
2022	Marcelo Medel, *Personalized product recommendation system in an e-commerce*, Master in Data Science, Universidad del Desarrollo.
2022	Alejandro Mendez, *Classification and prediction of tree types in the Roosevelt Reserve using cartographic data*, Master in Data Science, Universidad del Desarrollo.
2022	Eduardo Inostroza, *Prediction of cardiovascular diseases in adults using machine learning methods*, Master in Data Science, Universidad del Desarrollo.
2021	Roxana Godoy, *Development of a customer retention model for a Telecommunications company*, Master in Data Science, Universidad del Desarrollo.
2021	Sergio Arancibia, *Impact of land use on mobility in the Metropolitan Region during pandemic times.* Master in Data Science, Universidad del Desarrollo.

Undergraduate

Expected 2024	Elías Moreno, *Simulating the Santiago of the Future: Implementation of a mobility simulator using mobile phone digital traces*, Computer Science Engineering, University of Chile
2021	José Tomás Vasquez, *Data Science in Transportation Logistics for Link Projects*, Industrial Engineering, Universidad del Desarrollo

SERVICE & OUTREACH

2020	Reviewer internal research projects, University of Bío-Bío, Chile
2014 - 2016	Vice president & secretary of *The Chilean Student Association at UNSW*, Sydney, Australia
2009 - 2012	Science communicator for *Explora-Conicyt* exhibitions, Chile
2010	Science communicator for *Observatorio Astronómico Nacional*, Chile

REFERENCES

Professor Christopher Tinney
Head of Exoplanetary Science, UNSW Research Group
University of New South Wales, Sydney, Australia
c.tinney@unsw.edu.au

Professor Francisco Rowe
Lead of the Geographic Data Science Lab, Department of Geography and Planning
University of Liverpool, UK
fcorowe@liverpool.ac.uk