

## EDUCATION

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### Cornell University

Ph.D. in Astronomy

Ithaca, NY

2021–Present

### Pontifical Catholic University of Peru

B.S. in Electrical Engineering. Ranked top 10% of graduating class.)

Lima, Peru

2011–2016

- Thesis: “Design of a LabVIEW-based polyphase filter bank spectrometer for radio astronomy using FlexRIO FPGA technology and CUDA-enabled GPU”

## EXPERIENCE

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### Graduate Research Assistant

Working on multiple aspects of the CCAT/FYST project.

Ithaca, NY

2021 –Present

- Ultimately responsible for the mechanical design of the Epoch of Reionization Spectrometer (EoR-Spec). The EoR-Spec has been designed to probe the redshifted [C II] 158  $\mu\text{m}$  fine-structure line emission from aggregates of galaxies in the early universe ( $z = 3.5$  to 8).
- It features a detector array of more than 6000 Kinetic Inductance Detectors (KIDs) and a cryogenic, scanning Fabry-Perot Interferometer (FPI) that covers the full spectral range of 210-420 GHz with a resolving power of  $R \sim 100$ .

### Atacama Cosmology Telescope

Site Engineer. Supervisors: Prof. Suzanne Staggs and Prof. Mark Devlin.)

San Pedro de Atacama, Chile

Oct 2019 –Jul 2021

- Ensured the continuous and smooth operation of all of the telescope’s subsystems, such as a the cryogenic cooling system ( $\sim 90\text{mK}$ ).
- Performed calibration procedures like the alignment of the receiver and the primary and secondary reflectors through high-precision photogrammetry ( $\sim 10\mu\text{m}$ ). Carried out frequency response measurements of the detector arrays through Fourier Transform Spectroscopy.
- Participated in the deployment of the Advance ACTPol low-frequency detector array (27/39 GHz). Assisted in the installation of the new chain of filters and cold silicon reimaging optics.

### Management Solutions

Assistant Business Consultant

Lima, Peru

Sep 2018 –Jul 2019

- Worked in big data and bank stress test for a major local bank. Also worked in software development and data science for a leading financial institution in Madrid, Spain.

### Institute for Radioastronomy

Research Assistant. Supervisor: Prof. Jorge Heraud

Lima, Peru

May 2017 –Aug 2018

- Worked in the design and construction of an 8-meter diameter radio telescope (RT8). Designed several hardware and software systems for the telescope’s electromechanical pointing system.
- Assisted in the design and characterization of an hydrogen 21-cm line feedhorn and its RF over Fiber (RFoF) frontend. Developed an antenna test system based on a custom-made positioning goniometer and software-defined radio technology from Ettus Research.

## PUBLICATIONS

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- [1] **R. Freundt**, Y. Li, D. Henke, J. Austermann, J. R. Burgoyne, S. Chapman, S. K. Choi, C. J. Duell, Z. Huber, M. Niemack, T. Nikola, L. Lin, D. A. Riechers, G. Stacey, A. K. Vaskuri, E. M. Vavagiakis, J. Wheeler, and B. Zou, “CCAT: A status update on the EoR-Spec instrument module for Prime-Cam”, in *Millimeter, Submillimeter, and Far-Infrared Detectors and Instrumentation for Astronomy XII*, vol. 13102, SPIE, Aug. 16, 2024, pp. 343–352.
- [2] R. G. Freundt and J. A. Heraud, “Design of a LabVIEW-based polyphase filter bank spectrometer for radio astronomy using FlexRIO FPGA technology and CUDA-enabled GPU”, in *2017 XXXIIInd General Assembly and Scientific Symposium of the International Union of Radio Science (URSI GASS)*, Aug. 2017, pp. 1–4.

## TEACHING

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- **Student Teaching Assistant** at Middle East Technical University Spring 2018  
*Programming Language Concepts (CENG 242)*
- **Student Teaching Assistant** at Middle East Technical University Fall 2016  
*Introduction to C Programming (CENG 230)*

## SKILLS

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- **Programming:** Python, Matlab, C/C++, Java
- **M. Learning:** PyTorch, TensorFlow, Keras, Chainer
- **Tools/Techs:** LaTeX, Git, SQL
- **Web:** HTML/CSS, Jekyll, JavaScript

## LANGUAGES

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- **English:** Proficient, TOEFL iBT score: 112/120
- **GRE:** V: 162/170, Q: 170/170, AW: 4.0/6.0
- **Turkish:** Mother tongue, native speaker
- **Spanish:** Conversational, CEFR level: A1-A2

## PROJECTS

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See full list of projects on [dcetin.me/projects](https://dcetin.me/projects)

- **eth-cs-notes** (LaTeX/Markdown, 2019)  
Lecture notes/cheatsheets for Master’s in CS
- **bert-adv-embed** (Python/Chainer, 2019)  
Adversarial perturbations on BERT word embeddings

## SCHOLARSHIPS AND AWARDS

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- ETH Zurich Direct Doctorate Scholarship 2018–2020
- 3<sup>rd</sup> place in METU Ceng Demo Day 2018, final year project exhibition of the department 2018
- Erasmus+ Traineeship Scholarship 2017
- Summer@EPFL Scholarship 2016
- METU Development Foundation Scholarship for Outstanding Success 2013–2018
- Merit based Prime Ministry Scholarship 2013–2018
- Isbank Altın Gençler Award and mobility grant 2013
- Ranked 4<sup>th</sup> among 1.9 million participants nationwide in Undergraduate Placement Examination (LYS) 2013

## VOLUNTEERING & MENTORING

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- Career Mentor at Crossing Paths 2017–Current  
*Helping undergraduate students on their career goals, also took part in their Career Chats program*

- Master Helper at ETH VIS Welcome Day 2019 Fall 2019  
*Mentored newcomer Master students, gave a campus tour and aided them in Study Planning Workshop*
- C Programming Language Tutor at IEEE METU Student Branch Fall 2016  
*An introduction to programming and a tutorial for the school courses for non-CS students*
- Official Turkish localization of the video game Human Resource Machine Winter 2015  
*A puzzle game by Tomorrow Corporation, simulating a simple computer in an office environment*