Hyerin Cho

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EDUCATION

GIST(Gwangju Institute of Science and Technology), Korea
B.S. Physics Major, Math Minor March 2015 - Present
Overall GPA: 4.0/4.5
Major GPA: 4.4/4.5 [1]

California Institute of Technology September 2017 - December 2017
Study Abroad Program
Ph127a Statistical Mechanics,
Ph77a Advanced Physics Laboratory,
ACM116 Introduction to Probability Models,
Ay20 Basic Astronomy and the Galaxy,
Ph103 Atomic and Molecular Physics(audit), Ph125a Quantum Mechanics(audit)

University of California, Berkeley June 2016 - August 2016
Summer Session
Chemical Structure and Reactivity
The Beauty and Joy of Computing

RESEARCH EXPERIENCE

OzGrav, Swinburne University of Technology March 2019 - Present
Visiting Student Intern
Supervisor: Prof. Matthew Bailes

Pipeline of Full Time Resolution Recovery for Localized ASKAP FRBs.
The work is continued from the previous project from CIRA. I am working on refining the reconstruction process for FRB180924 for more accurate results, and will generalize this process to a pipeline applicable for any localized ASKAP FRBs. FRB181112 will also be reconstructed for high resolution time domain FRB science.

Population Analysis for Radio Telescopes.
Work in progress.

Curtin Institute of Radio Astronomy (CIRA) December 2018 - February 2019
Visiting Research Associate / Summer Studentship
Supervisor: Dr. Clancy James, Professor Jean-Pierre Macquart

Recovering the Full Time Resolution of ASKAP FRB Voltage Data.
As a member of The Commensal Real-time ASKAP Fast Transients Survey (CRAFT) team, I worked on inverting channelization of voltage data to retrieve its full time resolution. ASKAP's high time-resolved voltage data enables quantum optical analysis of FRBs. This new diagnosis of FRBs is expected to reveal information about the source's emission properties, and thus help solve the mystery of its origin. I took voltage data from ASKAP and recovered its full time resolution via off-line processing. In particular, I used ASKAP's first localized FRB180924, but this process will be applicable to all ASKAP's localized FRBs. Most of my work was done with Python to coherently sum signals

[1] The courses with PS(Physics) course code in GIST transcript, including courses taken at Caltech.

from antennas, invert the channelization (PFB), and coherently de-disperse.

Caltech Theoretical Astrophysics June 2018 - August 2018
Summer Undergraduate Research Fellow
Supervisor: Professor Sterl Phinney

Numerical Modeling of Time-Independent Accretion Discs with Instabilities.
I wrote from scratch Python code that solves the time-independent accretion disc equations numerically. These included OPAL and Ferguson opacities, equations of state, and treatment of convection. The purpose of the project was to make realistic and general models of accretion discs covering all parameter space from Cataclysmic Variables to Active Galactic Nuclei and to investigate instabilities caused by the onset of convection and hydrogen recombination.

GIST General Intelligence and Smart Environment Laboratory
Student Intern October 2015 - August 2017
Supervisor: Professor Kin Choong Yow

Studying Deep Learning and its applications to physics problem.
I worked on a project to derive physical formulas from data by modifying Google's TensorFlow Python code.

TEACHING EXPERIENCE

Teaching Assistant March 2018 - June 2018
GIST PS3101 Electromagnetism II (3rd year course)

I was selected to be the Teaching Assistant as the best student of previous year's class. I graded problem sets, midterm and final exams. I also held weekly office hours to answer questions from students.

PUBLICATIONS

Reconstruction of ASKAP FRBs to the Order of a Nanosecond Time Resolution via Polyphase Filterbank Inversion
First author, *in preparation*

TALKS

Caltech SURF Seminar Day August 2018
Presentation of summer research project.
ICRAR Summer Student Talk February 2019
Presentation of summer research project.

AWARDS & FELLOWSHIPS

Korea National Science and Engineering Scholarship[2] March 2015 - Present
Caltech Summer Undergraduate Research Fellowship June 2018 - August 2018
CIRA Summer Studentship December 2018 - February 2019

TECHNOLOGY SKILLS

Programming Languages:
Working knowledge of: Python, MATLAB, bash
Familiar with: C++, Mathematica
Basic knowledge of: Fortran, C, html
Operating Systems: Linux, Windows
Others: MESA, TensorFlow

LANGUAGE PROFICIENCY

Korean (native)
English (fluent[3])

[2] Full tuition covered for four years.
[3] Cumulative 3 years in the U.S. during middle school and university.

Japanese, Chinese (basic knowledge)

OTHER ACTIVITIES

GIST student ambassador, *Member* March 2015 - December 2015
GIST student council, *Member* June 2015 - February 2016
GIST student ambassador, *Vice President* December 2015 - December 2016
MESA[4] Summer School, *Student* August 2018
Palomar Observatory observing proposal accepted for one night August 2018
Spectroscopic follow-up observation of several short period binaries discovered with ZTF

HOBBIES

Hiphop dance
I was a practice director of a dance club in GIST, and I was also an instructor for a hiphop class in Caltech.

[4]Modules for Experiments in Stellar Astrophysics