

Division of Electrical Engineering and Computer Science	Research field	Communication and Information Engineering	Lab. ID EC10
Laboratory web site	<a href="http://www-cie.is.t.kanazawa-u.ac.jp">http://www-cie.is.t.kanazawa-u.ac.jp</a>		
<b>Research subjects</b>			
<p>We study intelligent data processing techniques for (1) high-speed signal processing generated from sensors, (2) scientific discoveries from enormous database, and (3) remote sensing by radio wave and inverse problem in wave propagation. The detailed description of these topics are as follows:</p> <p>(1) Our interests especially focus on plasma wave receiver implemented on spacecraft for solar-terrestrial plasma physics. Intelligent signal processing technique is necessary to send valuable information with low-data-rate communication line. (2) We study on the computational techniques for knowledge acquisition, pattern recognition, and similar data retrieval from enormous database. Integrated database system and interdisciplinary data integration on earth and space science are also our research topic. (3) Using radio waves such as radar and GPS system, we study solutions of ill-posed problem in shape reconstruction of objects, spatial structure of propagation media and estimation of size and location of wave source.</p>			
<b>Master/Doctor course: Education policy, curriculum, typical activity in the laboratory</b>			
<p>Master course: Students decide their practical subject for the Master thesis after consultation with staffs and belong to one of the research groups. They attend group meetings regularly held once a week and report progress of their own research projects. They are also expected to take several classes each week in the first grade.</p> <p>Doctor course: Doctor students work on their own research projects. They attend group meetings regularly held once a week. They are expected not only to report progress of their own research projects but also to discuss extensive research topics with the other members. They are encouraged to go for outer activities, participating research workshops/meetings and international conferences.</p>			
<b>Daily life in the laboratory, etc.</b>			
<p>Our laboratory is open for 24 hours and 7 days a week for research work. All relevant students of undergraduate, Master, Doctor and post Doc researchers share the laboratory rooms and discuss with each other there. Personal working desk with a personal computer is available for every student.</p> <p>We organize many activities, such as welcome party for new comers, beer party and sports tournaments in summer, excursion in autumn, and farewell party for graduates.</p>			
<b>Message or comments by the laboratory faculty staffs</b>			
<p>We participate in several spacecraft projects conducted by Japan Aerospace Exploration Agency (JAXA), and other collaborative research projects with National Institute of Information and Communications Technology (NICT), National Institute of Informatics (NII) and many universities. It is a good opportunity for students to work under such big projects. The experience would be useful for any careers after graduation. Most of the Master graduates work for electronics industries and IT companies. A part of them go on to the Doctor course. After taking the doctoral degree, they work as research or educational staffs.</p> <p>We hope that students devote most of their time to their own research project.</p>			
<b>Recent Master theses in these 3 years (+ more if appropriate)</b>			
<b>year.month</b>	<b>Thesis title (including English translation of Japanese thesis title)</b>		
2017.3	Development of a ground data processing/calibration system for the plasma wave experiment on board the ERG satellite		
2017.3	Study on estimation method of lunar surface permittivity using natural waves observed by KAGUYA/WFC-H		
2017.3	Study on latitudinal distribution of propagation mode of auroral kilometric radiation observed by KAGUYA		
2017.3	Study on data-based modeling of wave spectra observed by Akebono WBA		
2017.3	Study on improvement of estimation method of ionospheric TEC from single frequency GPS signals		
2016.3	Research on elevation angle effect on GPS signal delays for the ionospheric TEC estimation		
2016.3	Statistical analysis of features of chorus elements observed by Akebono		
2016.3	Development of a FPGA Module of Spectral Matrix Calculator for Plasma Wave Instruments		
2016.3	Development of a repository system suitable for accumulation and disclosure of observation data from scientific satellite		
2016.3	Improved retrieval algorithm of the similar data retrieval system for KAGUYA/WFC-L		
2015.3	Study on next-generation authentication system adaptable to various information services		
2015.3	Development of the FPGA board for evaluation of onboard digital signal processing of plasma wave instruments		

2015.3	Development of parallel distributed processing environment for data analysis obtained by scientific satellite using NICT science cloud
2015.3	Classification of Akebono WBA wave data by a frequency modulation analysis
2015.3	Estimation of plasmopause location using signal delay of GPS and QZS
2014.9	Study on direction finding method using wave distribution function with Markov random field model
2014.3	Analysis of plasma waves, magnetic field and particles over the lunar magnetic anomaly observed by KAGUYA
2014.3	Proposal of co-operational method for formation flying satellites equipped with autonomous decision function of the observation region
2014.3	Estimation of lunar surface permittivity using natural wave reflection
2014.3	Stochastic analysis of auroral kilometric radiation observed by KAGUYA
2013.3	Study on characteristic frequencies of EMIC waves and estimation of ion constituents in the vicinity of magnetic equator
2012.9	Study on similar data retrieval from plasma wave spectrum observed by solar-terrestrial satellites
Recent Doctoral theses in these 3 years (+ more if appropriate)	
year.month	Thesis title (including English translation of Japanese thesis title)
2017.3	Study on Omega Signals Observed by Poynting Flux Analyzer on board the Akebono Satellite
2017.3	Development of a New Method to Estimate Ionospheric TEC Distribution by Single Frequency Measurements of GPS Signals
2017.3	Development of a General Purpose Data Warehouse for Utilization Promotion of University Portal
2017.3	Development and evaluation of analysis methods for science data based on statistical learning theory
2015.3	Diagnostics of multicomponent plasma using EMIC waves observed by the Akebono satellite
2015.3	Data selection and statistical analysis of characteristic plasma wave observed by science spacecraft
2012.9	Study on dispersion of lightning whistlers observed by Akebono satellite in the Earth's plasmasphere
Laboratory mail address	
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