

ADVANCED SCIENCE AND TECHNOLOGY INSTITUTE

FY 2018 R&D Projects

No.	2018 Project/Program/ Activity Name	Brief Description	Beneficiaries	Status
1	Development of the Department of Energy - Online System for Energy Collaboration and Cooperation (DOE-OSECC) Phase I: 1. Energy Data Center Management System (EDCMS) 2. Energy Efficiency Information System (EEIS) 3. Oil Products Web-based Information System (OPWIS) 4. ER-1-94 Financial Management Information System (FMIS)	The project intends to provide better services to clients, particularly at identifying the processes, data and people involved that will determine the functionalities the systems. It also aims to identify issues and concerns, and how these systems might offer a better streamlined DOE processes and provide efficient delivery of information, products and services among the group and clients. Included in this component are the creation of ER-1-94 Financial Management Information System (FMIS), the Energy Data Center Management System (EDCMS), the Oil Products Web-based Information System (OPWIS) and the Energy Efficiency Information System (EEIS).	DOE; General Public	Completed
2	Department of Energy (DOE) Project Phase 3: 1) Development, Enhancement, and Adoption of the Department of Energy – Online Service Management System (DOE-OSMS) for Legal Services Information System (LSIS) and Energy Services Information System (ESIS); 2) Development, Enhancement, and Adoption of the Department of Energy – Critical Energy Installation Information System (DOE-CEIIS); and 3) Development of the Department of Energy - GIS Geodatabase (DOE-GIS) and Upgrade of the Energy Resource Information System	The project involves development of three DOE information systems, namely: 1) On-line Service Management System (OSMS); 2) Critical Energy Installation Information System (CEIIS); and 3) GIS Geodatabase. The OSMS is a web-based application that enables the DOE's various stakeholders to create their own account in the system, which will be used to access, store, track, and retrieve the system's offered services. The CEIIS is a web-based GIS application that provides efficient access, timely and accurate information to various critical energy installation stakeholders, i.e., consumers, businesses, other concerned government agency and the general public. Lastly, the GIS Geodatabase is a web-based application that collects and builds database of energy contract areas, and application.	DOE; General Public	On-going
3	Development of Housing Beneficiary Monitoring and Evaluation System (HBMES)	The Housing Beneficiary Monitoring and Evaluation System (HBMES) is being developed in support of the Housing and Urban Development Coordinating Council's (HUDCC) monitoring and evaluation function of determining the prospective number of housing beneficiaries. This database system will consolidate information on housing beneficiaries (awarded) and is accessible to HUDCC, Key Shelter Agencies and other intended users.	HUDCC; Key Shelter Agencies; General Public	On-going
4	Deep Learning and Natural Language Processing Approach to Predicting Case Decisions in the Supreme Court of the Philippines	This project aims to assess the feasibility of using deep learning for natural language processing in application to automatic binary classification of filed court cases into two classes: (1) with violation and (2) without violation. It will analyze the predictive performance of deep learning models in comparison to previously developed machine learning models for binary classification of cases in the Supreme Court of the Philippines. This research initiative will complement the Hustisyeh Program of the Supreme Court specifically in the classification of court cases for the purpose of preliminary or permanent dismissal.	Philippine Judiciary; Researchers	Completed

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5	Development of a Philippine Indigenous Instrument Sounds Database	The project focuses on the development of a digital database that will compile audio recording of Philippine indigenous music instruments and make them available to the public. The database will include instruments that are played in different pitches, dynamics and styles. Given that the database will be available to the public, Filipinos will be able to include Philippine sounds in their creative work. An online portal will be developed as an interface for the sound files.	Music Industry; General Public	On-going
6	Enhancing OneLab for Global Competitiveness – RDIs Component (OneLab) ver. 2	The project involves the establishment of a referral system that will primarily integrate the laboratories within the DOST system and eventually with partner laboratories from the private sector.	DOST-RDI Laboratories; Industries i.e. electronics, manufacturing companies	On-going
7	Remote Sensing and Data Science: DATOS Help Desk	The DATOS Project, funded by the Department of Science and Technology (DOST), builds on and integrates past and ongoing DOST-supported projects and related initiatives on disaster mitigation by providing a 24/7 help desk pre-, during, and post- disaster events that would provide remote sensing and data science applications support to critical activities on disaster mitigation, analysis, and advice. These activities require on-demand access to data currently available in the ASTI Computing and Archiving Research Environment (CoARE) and the Philippine Earth Data Resource Observation (PEDRO) Centers. Aside from the operations aspect, the Project also intends to conduct further research on RS and GIS, and data science in the context of these fields.	Institutions involved in Disaster Risk Reduction efforts for Post-hazard assessment and those involved in environmental assessment	On-going
8	Operation and Maintenance of the Electronics Product Development Center	The project focuses on the operation and maintenance of the Electronics Product Development Center (EPDC), a world-class facility designed to support the electronics industry by providing technical services such as electromagnetic compatibility (EMC) test, electronics product prototyping, etc. to promote innovation and high value product development. EPDC houses hardware and software tools and facilities that are being used by companies and schools to design, develop and test electronic products.	Electronics Industry; Academe; Research Institutions	Completed
9	EPDC as Platform for Inclusive Innovation Program (EPIIC) - Project 2: Electronic Products Inclusive Innovation Center	Its mission is to enable and encourage innovative solutions that have the potential to add significant value to the Philippine economy. In pursuit of this mission, the DOST-ASTI shall take advantage of the Electronics Product Development Center (EPDC) to carry out research and development initiatives that can improve the competitive advantage of the local electronics industry. The medium for this effort shall be the Electronic Products Inclusive Innovation Center (EPIIC).	Electronics Industry; Academe; Research Institutions	On-going
10	Study and Development of a Self-sustaining Smart Street Lighting System	This project aims to contribute to the development of systems that will help reduce the consumption of power from the grid. These systems can harvest energy from different renewable energy sources, such as the sun, wind, and road vibrations. In turn, this is intended to power an intelligent lighting system that can adapt to different street scenarios in the local setting by considering both vehicular and pedestrian traffic, time of day, etc. The intelligent lighting system may collect data that are useful for statistics and other studies. With this, the project also aims to contribute to the road and pedestrian safety and serve as a platform for sensors that can be used for other smart city programs and projects.	General Public LGUs	Completed

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11	Development of an Unmanned Aerial Vehicle for Disaster Risk Reduction Application (UAV)	As the initial research effort in the field of unmanned aerial vehicles, this project aims to design a system to be used for disaster-related events. The UAV can be used to gather critical information from aerial sensors through mapping of disaster zones and to develop better communications tools for disaster relief workers on the ground to ensure that an area is prepared for disaster and/or avoid damage and reduce casualty rates. This project also supports the pre- and post-disaster surveillance efforts of various agencies, such as DOST-PHIVOLCS, NDRRMC, etc.	Institutions involved in Disaster Risk Reduction	Completed
12	Construction of a Heavy-Lift Multi-rotor Aerial Vehicle	This project aims to continue and expand the initial efforts of the UAV project. It focuses on the study of heavy-lift multi-rotor drones. Through this research endeavor, technical capability of ASTI staff in building and customizing heavy-lift multi-rotor drones will be developed.	ASTI	Completed
13	Development of a Hardware Platform for the ASTI Timekeeper System	This project focuses on the design of a hardware platform for the ASTI Timekeeper System. It will be integrated with the Enterprise Resource Planning (ERP) System, which will provide up-to-date, if not real-time, daily time records automatically.	ASTI	Completed
14	Automation of ASTI Research and Development (R&D) Workflows and Processes: Phase I	The project aims to improve the R&D processes of DOST-ASTI through automation and creating online presence of applicable R&D activities. It involves streamlining of R&D processes, creation of process models on the applicable R&D activities, and development of automated processes.	ASTI and other DOST Agencies	Completed
15	Automated Electronic Survey System	The AES project aims to reduce the cost of conducting paper-based collection, processing and aggregation of data by providing a reusable standards-based transparent framework of technologies, systems and protocols. The system will address the need of users who require a high level of visibility into the functionalities of such a system for purposes of determining the credibility and accuracy of the results. It will also provide an open, transparent, and secure development framework that will enable better interoperability/integration with other products and widen the number of potential competent third-party providers who may offer better support, maintenance and technical services.	COMELEC	On-going
16	ASTI Labeling Machine (ALaM)	It's a seed project to establish a core team of AI / ML researchers in ASTI. Initially, it is geared towards the automated identification of natural and man-made objects in satellite images that could be used as reference data for applications in land management, infrastructure maintenance, urban planning, disaster risk assessment & mitigation, agriculture, and forestry. The project also aims to develop deep learning models for detecting and classifying features found in satellite-captured images for any identified purposes such as for disaster response where features may correspond to buildings and classifications may correspond to a range of structural integrity of buildings.	Disaster response agencies; Land-use management agencies; Filipino researchers working on Artificial Intelligence and image processing	Completed
17	AI Robot	The AI Robot project aims to initiate ASTI research efforts on robotics. The team were able to construct a prototype that moves autonomously and provides visuals of the disaster area, as well as the location of the casualties, that helps execute faster and safer	ASTI, NDRRMC, Philippine Red Cross, LGUs	Completed

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18	Communications Relay Buoys for CoCoMoNets Project	<p>The Communications Relay Buoys for the CoCoMoNets Project originated from the research conducted by the Philippine-California Advanced Research Institutes called Village Base Station Project, which aimed at finding a solution to connect isolated coastal communities in Aurora Province with little or no mobile network signal by deploying low-cost, low-power, and 2G compact GSM base stations. However, despite the breakthrough, the spectrum usage and operational costs have been the major factors that limit the continuous operation and adoption of the community cellular networks (CNN) technology in the country.</p> <p>With its experience, the ASTI takes part in the investigation of relay buoy as an alternative backhaul solution. The project focuses on the study of the effects of sea conditions in the signal propagation which will then provide the design parameters of the relay buoy. The proposed technology may not only cater the sustainability requirements of the CoCoMoNets project but could also come up with a potential backhaul solution for other forms of communication systems.</p>	General Public; LGUs	On-going
19	Development and Deployment of Advanced Spectrum Sensing Platform Network	<p>The project involves the use of a software-defined radio (SDR) and field-programmable gate array (FPGA) in measuring RF spectrum used for wireless broadcasting and telecommunications services. The system also includes advanced signal processing algorithms for providing important information about spectrum resources such as higher-order statistical processing and parametric signal analysis aside from the conventional energy detection schemes. The hardware devices will be deployed in different locations to collect real-time data. The spectrum data will be stored in a central server and database for post processing and analysis utilizing the storage and high-performance computing capabilities of the CoARE Facility.</p>	Institutions involved in Disaster Risk Reduction efforts for Post-hazard assessment and those involved in environmental assessment	On-going
20	Development of Software Defined Radio (SDR) based Satellite Telemetry and Telecommand (TM&TC) System Simulator	<p>An integral part of the satellite space mission, with the historic launching of DIWATA-1 in 2016, is the ground station which primarily tracks and communicates with the satellite to retrieve valuable telemetry and payload data from the satellite and to transmit the necessary telecommands to the satellite. While the technology for the ground receiving station is already mature, the traditional ground stations often lack the flexibility and are often confined with the hardware equipment specifications. Since flexible and versatile software-defined radio (SDR) transceivers with quite convincing performance are already available, it is now being considered to be utilized as a viable option in building a ground station.</p> <p>The telecommand and telemetry functionality of the ground station such as the modulation/demodulation and encoding/decoding will be implemented in an SDR platform. Furthermore, the key considerations in the design and implementation of an SDR-based ground segment will be also investigated.</p>	Institutions involved in Disaster Risk Reduction efforts for Post-hazard assessment and those involved in environmental assessment	Completed

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21	Development of Extreme Weather Monitoring and Information Sharing System in the Philippines: Understanding Lightning and Thunderstorms (ULAT)	<p>This a project undertaken under the Collaborative Research Agreement with Japan International Cooperation Agency (JICA), Japan Science and Technology (JST) and Hokkaido University. It is an Official Development Assisted (ODA) project under the initiative of Japan's Science and Technology Research Partnership for Sustainable Development (SATREPS) Program.</p> <p>It aims to observe the country's weather behaviors by studying torrential rainfall and thunderstorm occurrences as parameters to eventually enable short-term forecasts. Through the automated weather stations developed by the Japanese experts, equipped with various sensors that measure both weather parameters and lightning occurrence, a network of 60 lightning instruments is expected to be established in the Philippines, particularly in Metro Manila, to collect torrential rainfall data and lightning events. If proven to be accurate, the project will be able to hasten weather forecasts benefiting</p>	Institutions involved in Disaster Risk Reduction efforts Scientific Researchers	On-going
22	Synthetic Aperture Radar (SAR) and Automatic Identification System (AIS) for Innovative Terrestrial Monitoring and Maritime Surveillance	The project aims to operationalize the distribution of SAR and AIS data to different government agencies. Various researches on applications for terrestrial monitoring, maritime surveillance, etc will be conducted.	Government agencies; LGUs; Academe	On-going
23	Establishment of Agro-Meteorological Stations in Highly Vulnerable Agricultural Areas: A Tool for Climate Change Adaptation and in the Development of Local Early Warning System" (AGROMET cum CLIMATE CHANGE)	The Agromet cum Climate Change Project is jointly implemented by the ASTI and the Bureau of Soils and Water Management of the Department of Agriculture. It aims to develop a system for agrometeorological data gathered by the automated weather stations (AWS) installed in site-specific locations across the country. Primarily, the data are used for better-quality management of agricultural resources and empowering farmers to decide what to plant and when to plant their crops, both of which are essential on food security and economic development.	Bureau of Soil and Water Management (BSWM); General Public	Ongoing
24	Metbouy Upgrade Maintenance and Repair (Phase II)	The METBUOY Project started as a multi-agency project collaboration aimed to address the need for a sustainable and cost effective off-shore meteorological buoy system. The device, deployed at approximately five (5) kilometers from the shoreline, can obtain ocean and maritime data that can be useful for marine weather observation and forecasting, as well maritime safety. It is equipped with sensors that collect wind, relative humidity, air temperature, barometric pressure, rainfall and sea temperature data. Collected data are then communicated by the device via GSM/GPRS into the database server located in DOST-ASTI. The upgrading of the metbuoys installed in Matnog, Sorsogon and Aborlan, Palawan to improve the features, functionalities and performance was already completed.	Institutions involved in Disaster Risk Reduction efforts for Post-hazard assessment and those involved in environmental assessment	Completed
25	Optimization of the Operational Capabilities of Hydromet Sensors in Line with International Standards (WMO Standard) for Effective Weather Flood Warning (CBFEWS) and Application to Research	This project involves retooling, repositioning and augmentation of the instruments, equipment and related facilities installed through the HYDROMET and HYBRID Projects to enable more efficient maintenance, calibration and accurate data collection that will conform with the highest standard of the hydro-meteorological observation. These hydromet stations will be eventually integrated and transferred to PAGASA.	Government agencies particularly those involved in Disaster Risk Reduction; LGUs; Private companies; General public	On-going

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26	Network Measurement	The project aims to develop a dashboard for bandwidth and latency measurement of PREGINET regional nodes. It involves deployment and setting up of network measurement tools.	Government agencies; LGUs; academic institutions; and private sector	Deferred
27	Profiling the Network Data of PREGINET	This project aims to create the network data profile of PREGINET. It involves setting up of a system for collecting netflow records. Bulk of PREGINET traffic will be identified and classified and network flow data will be analyzed. Periodic reports indicating top users, sites and applications consumed by PREGINET users will be generated.	PREGINET users; ASTI	Deferred
28	Internet of Water	This project, which is spearheaded by UP Los Baños in partnership with the University of California Berkeley, involves development of wireless sensor networks for real-time monitoring of relevant hydrologic, meteorological soil and water conditions and development of web-based water information system to be used for developing optimum and efficient irrigation scheduling and application schemes, and possible automation of the irrigation systems. The involvement of DOST-ASTI is on the provision of technical advice on the design, deployment, operation and maintenance of Wireless Sensor Network based water information system and in further conceptualization of local applications of the	UPLB; Agriculture sector	On-going
29	Development of ERP Procurement System Phase II	The Phase II of the project aims to develop procurement modules from Purchase Request to Purchase Order. To ensure that the project is consistent with the requirement of procurement laws and is usable to its client, end users, the Procurement Management Section, Bids and Awards Committees (BAC), BAC Secretariat and other groups involve in procurement will be engaged from the requirements gathering face until the validation of the developed	ASTI	On-going
30	Development of Programs and Projects Database Phase II	This project aims to develop a repository of programs and projects including the details and documentations. It involves development of a web-based application that will automate the monitoring of projects online as well as the preparation of physical and financial accomplishment of projects.	ASTI; DOST Central Office	On-going
31	ERP System for PHIVOLCS	The ERP System is an online management information system consisting of various features such as: Centralized repository of Personal Data Sheets; online filing of pass slips; leaves; transportation and room reservations; inventory system; Daily Time Record generation; and Purchase Request generation. This system was adopted by PHIVOLCS for a more efficient and systematic day to day operation, provision of timely and consistent information across the integrated system, and quick access to work tools and relevant information.	PHIVOLCS	Completed