FAPESP
SÃO PAULO RESEARCH FOUNDATION

FAPESP'S ENGINEERING RESEARCH CENTERS (ERC)

PARTNERSHIPS FOR INNOVATION

FAPESP'S ENGINEERING RESEARCH CENTERS (ERC)

One of the current challenges to the progress of knowledge is the complexity of the problems to be addressed, often requiring longer than the two to five years of funding traditionally offered by FAPESP in the form of Regular Research Grants and Thematic Projects, or the typical projects supported by FAPESP's Research Partnership for Technological Innovation Program (PITE).

Long-term funding and interdisciplinary approaches in many cases permit successful treatment of complex problems. For this reason, FAPESP created its Special Program for Research, Innovation & Dissemination Centers (RIDCs), which supports long-term research projects. A bold approach is needed to surmount these challenges. At the same time, identifying the problems often requires partnering with companies or government entities that are directly linked to society.

FAPESP's Engineering Research Center (ERC) Program uses the successful model of the RIDCs and associates it with PITE, with **a partner firm co-funding the research in each case**. Partners are strongly motivated to participate in defining the focal themes to be investigated, to play an active role in research projects, and to use the results obtained by the Engineering Research Center concerned.

The most important feature of an ERC's action plan is the multiplicity of its missions. The primary mission that grounds its activities is to execute complex research projects at the knowledge frontier, **oriented by real problems** and in pursuit of well-defined results that help form a world-class research center. In addition, the ERC's internationally competitive core research team must develop effective means to **transfer technology**, promote education, and disseminate knowledge.

The complexity of executing an ERC's action plan requires **long-term funding and autonomy** in the use of resources. This in turn requires a strong institutional link to the co-funding partner and suitable means for rigorous oversight of its activities.

In summary, an ERC supported by FAPESP must demonstrate:

a) World-class research at the knowledge frontier, either basic or application-oriented, in both cases actively exploring opportunities to contribute to problem solving and to produce well-defined results with demonstrable potential to create social impact and technological innovation;

b) Knowledge transfer to the partner firm and society including the business sector, the non-governmental sector and/or the public sector. Examples of valuable achievements along these lines include:

   b.1 Projects executed in partnership with companies or governmental or non-governmental entities responsible for public policy. These projects may benefit from FAPESP's Research Partnership for Technological Innovation Program (PITE) or its Public Policy Research Program (PPP).

   b.2 Creation of startups to incorporate the results research performed by the ERC into products or services. These small enterprises may benefit from FAPESP's Innovative Research in Small Business Program (PIPE).

c) Interaction with the education system, especially primary and high schools, for example, via FAPESP's Public Education Improvement Program.

EXPECTED BENEFITS OF ENGINEERING RESEARCH CENTERS

ERCs help make the research environment in universities and/or research institutions broader and more connected to society, so that undergraduates and graduates are better trained and new themes of advanced research are covered.

For companies, partnering with universities creates continuous interaction that encourages them to tackle new challenges and stay in touch with the knowledge frontier.

For São Paulo State, the agreements between FAPESP and partner firms in the ERC program result in more scientific and technological development, fueling business competitiveness and reinforcing the creation of a climate that stimulates technological innovation in the state.

In the current stage, ERCs are selected in public calls for proposals agreed between FAPESP and the associated companies. Consultations from university executives may exceptionally be received if they represent special opportunities for ERCs that match the above description. Each consultation is analyzed, and the university executive concerned is notified that they may submit a complete proposal.

CENTER OF EXCELLENCE IN NEW TARGET DISCOVERY (CENTD)

Goal: Rational approach for searching molecular targets involved in inflammatory events and cell survival

Coordinator: Ana Marisa Chudzinski Tavassi

Host Institution: Butatan Institute / São Paulo State Secretariat of Health

Business partner: GlaxoSmithKline Brasil Ltda (GSK)

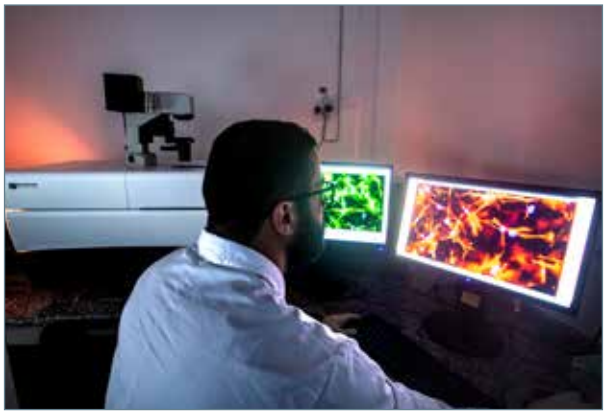

Photo: Rafael Porto

CENTD is the result of a public-private partnership (PPP) between the Butantan Institute, FAPESP and GlaxoSmithKline (GSK). The team works to identify and validate molecular targets involved in inflammatory diseases with the aim of developing new drugs, using venoms, animal secretions, as well as natural and synthetic molecules as study tools.

The first phase of the project (2015-2020) focused on identifying new therapeutic targets. The second phase (2021-2026) aims to validate the previously selected molecular targets.

CENTD's laboratory, hosted by Butantan Institute, houses specialized technologies that enable it to work in a dynamic and collaborative way. It has high-performance platforms for bioinformatics, proteomics and chemoproteomics, microscopy, imaging flow cytometry, molecular biology, and molecular target validation. Furthermore, different cellular models are developed in the laboratory for the analysis and identification of molecular targets.

Since it was launched in 2015, CENTD published of scientific papers in reputable journals, generated patents (filed both in Brazil and abroad) and carried out scientific dissemination, innovation and entrepreneurship activities aimed at society in general. Among these initiatives are the training of managers for areas of innovation and technology transfer, and the training of researchers, undergraduates and postgraduates for scientific entrepreneurship (transformation of scientific research into new health businesses).

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FAPESP Process 2015/50040-4
Phase 1
Term: Dec 2015 to Nov 2023

FAPESP Process 2020/13139-0
Phase 2
Term: Oct 2021 to Sep 2026

RESEARCH AREAS

- Poisons, toxins and cytoprotective molecules as tools for searching for new molecular targets;
- Biobank and screening of poisons, toxins and peptides: searching for new anti-inflammatory, analgesic and tissue regenerative compounds;
- Inflammatory and anti-inflammatory effects of animal poisons and bioactive molecules in models of tissue remodeling, cell survival and degenerative diseases;
- Validating molecular targets for drug discovery.

RESEARCH HIGHLIGHTS

Protein derived from tick saliva proves effective in the treatment of equine skin cancer
Experiments were conducted by scientists affiliated with the Center of Excellence in New Target Discovery, a research center supported by FAPESP, involving five animals with spontaneous skin tumors.

Venoms are source in the search for new medicine
The study of natural toxins and their derivatives may help in the development of medicines to treat diseases like cancer and osteoarthritis.

Among venoms, not just from snakes. Researchers investigate the action and possible uses of toxins
Scientists identified in human cell cultures the action mechanism of the venoms of the Brazilian caterpillar Premolis semirufa, which lives in the trunks of rubber trees, particularly in the Amazon. Contact with the bristles of the caterpillar causes severe inflammation and loss of hand movement, called pararamosis. The venom contains toxins that induce a clinical condition similar to that of osteoarthritis.

BV-FAPESP
Research projects supported in the Center Phase 1

BV-FAPESP
Research projects supported in the Center Phase 2

CENTER FOR RESEARCH IN IMMUNO-ONCOLOGY (CRIO)

Goal: Advancing research on novel targets for cancer immunotherapy drugs, particularly for tumors that have limited response to current therapies

Coordinator: Kenneth Gollob

Host Institution: Albert Einstein Israeli Institute of Education and Research (IIEPAE)

Business partner: GlaxoSmithKline Brasil Ltda (GSK)

Photo: CRIO

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FAPESP Process 2021/00408-6
Term: Jul 2022 to Jun 2027

Established in 2022, CRIO is a collaborative initiative between FAPESP and pharmaceutical company GlaxoSmithKline (GSK). Its headquarters are situated within Hospital Albert Einstein in São Paulo, Brazil.

CRIO emerged from a robust scientific partnership comprising Hospital Albert Einstein, A.C.Camargo Cancer Center, the University of São Paulo's Ribeirão Preto Medical School (FMRP-USP), Hospital Vila Santa Catarina, and GSK. Its mission is to pioneer the creation of knowledge that addresses the prevailing challenges in immunotherapy.

Immunotherapies are designed to combat cancer by bolstering a patient's immune response. While they are effective for various cancer types, responsiveness can differ: 12% to 60% of patients exhibit minimal or no response depending on the tumor type and individual differences. Additionally, potential side effects present further challenges. CRIO's primary objective is to identify and validate novel immunoregulatory targets to enhance treatment efficacy and the range of treatable tumors.

Furthermore, to increase the accessibility of immunotherapy, CRIO is dedicated to discovering biomarkers that predict patient responses to and severe adverse effects of both conventional and immune checkpoint therapy. Its overarching aim is to advance therapeutic strategies and improve the prognosis for cancer patients.

RESEARCH AREAS

1. Perform patient centric multiomics studies to discover molecules, pathways or cells critical to inducing anti-tumor immune responses across underserved cancers such as colon, lung, oral cavity, and gynecological cancers.
2. Leverage patient derived systemic and local tumor immune responses to understand potential points of intervention to increase anti-tumor responses and identify biomarkers of therapeutic response.
3. Perform individual patient tumor genomics and circulating tumor DNA analysis to identify potential targets and predictors of response.

4. Elucidate the role of the patient microbiome in therapeutic response and regulation of the anti-tumor immune response.
5. Perform and develop machine learning/AI tools for advancing high dimensional dataset analysis.
6. Regulate cancer specific immune response by targeting tumor-associated macrophages (TAMs) and regulatory T cells (Tregs).
7. Target tumor associated neutrophils and neutrophil extracellular traps (NETs) for cancer treatment.
8. Explore the effects of the SWI/SNF complex on gene regulation to subvert immune cell activation in cancer.
9. Set novel immune cell-based regulatory targets for colorectal cancer treatment.
10. Establish 2D, 3D and in vivo models of immune-tumor interaction for validation of potential immune-activating therapies.

RESEARCH HIGHLIGHTS

FAPESP launches Engineering Research Centers with Embraer, Ericsson and GSK

The Center for Research in Immuno-Oncology (CRIO), to be set up with GSK and hosted by the Albert Einstein Jewish Institute for Education and Research (IIEP), will pursue novel targets for cancer immunotherapy drugs to treat tumors that do not respond well to existing therapies, as well as seeking markers to predict which patients will respond best to immunotherapy.

BV-FAPESP
Research projects supported in the Center

ENGINEERING RESEARCH CENTRE IN ENERGY PRODUCTION AND INNOVATION

Goal: To develop innovative solutions for oil production optimization and management

Coordinator: Denis Schiozer

Host Institution: Faculty of Mechanical Engineering/University of Campinas (FEM-UNICAMP)

Business partner: Equinor Brazil

Photo: EPIC

EPIC was established in February 2019 through a partnership between FAPESP and Equinor (former Statoil), a Norwegian multinational energy company. The goal is to seek innovative solutions to optimize energy production, especially for oil well efficiency, reservoir recovery and better management of water removal from oil during drilling and extraction.

The center has a multidisciplinary team of 14 professors and 50 researchers from UNICAMP (School of Mechanical Engineering, Geosciences Institute, Computing Institute, School of Civil Engineering, School of Technology, Center for Petroleum Studies) and the University of São Paulo's Engineering School (POLI-USP) to lead the research and supervise students.

During the first five years, activities focused on research on oil production (E&P), with three main lines.

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FAPESP Process 2017/15736-3
Term: Feb 2019 to Jan 2029

BV-FAPESP
Research projects supported in the Center

RESEARCH AREAS

- Reservoir Management Production: optimization using reservoir simulation models.
- Artificial lift and flow assurance: production optimization, artificial lift and flow assurance inside ESP.
- Reservoir characterization: geological characterization and modeling of a carbonate reservoir from the Brazilian pre-salt.

RESEARCH HIGHLIGHTS

FAPESP and Equinor launch petroleum engineering research center
Aims of the center hosted by UNICAMP include developing innovative solutions to optimize oil well production and efficiency, as well as reservoir rehabilitation.

RESEARCH CENTRE FOR GAS INNOVATION (RCGI)

Goal: To propel Brazil towards a sustainable future by reducing greenhouse gas emissions and fulfilling Brazil's Nationally Determined Contribution (NDC) on climate change

Coordinator: Julio Romano Meneghini
Host Institution: Polytechnic School / University of São Paulo (Poli-USP)
Business partner: Shell Group

Photo: RCGI

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FAPESP Process 2014/50279-4
Phase 1
Term: Dec 2015 to Nov 2023

FAPESP Process 2020/15230-5
Phase 2
Term: May 2021 to Apr 2026

The Research Centre for Greenhouse Gas Innovation (RCGI) was founded as a world center for advanced studies on the energy transition, sustainable use of natural gas, biogas and hydrogen, and the management, transport, storage and usage of CO_2. Hosted at the University of São Paulo (USP), the center is the result of partnerships between FAPESP and private companies.

With a core focus on reducing greenhouse gas emissions and fulfilling Brazil's Nationally Determined Contribution (NDC) for climate change, the RCGI has emerged as a leader in advanced energy transition studies.

It has a team of 530 researchers representing a wide array of fields of science and technology. Its mission has three pillars: research, innovation, and the dissemination of knowledge.

Since 2015, the RCGI has conducted 46 projects spanning five comprehensive research programs: Engineering, Physical Chemistry, Energy Policies & Economics, CO_2 Abatement, and Geophysics. In a new phase beginning in 2021, it introduced five innovative programs: Nature-Based Solutions (NBS), Carbon Capture and Utilization (CCU), Bioenergy Carbon Capture and Storage (BECCS), Greenhouse Gas (GHG), and Advocacy. In 2023, two more programs were added: Innovation Power Systems and Decarbonization. It has also forged crucial collaborations with top-tier institutions in the USA through the Center to Center (C2C) initiative generously funded by FAPESP and NSF.

RCGI's ambition is to evolve into a world-renowned hub for advanced studies, focused on innovation and sustainability while actively mitigating greenhouse gas emissions, and to provide global solutions to climate change, the defining challenge of the 21st century.

Through the seamless integration of its seven core programs and the dynamic collaborations facilitated by C2C, RCGI has harnessed a wealth of knowledge and innovation from its research endeavors. These resources directly empower Brazil to achieve its NDCs, solidifying its position as a global renewable energy leader. RCGI stands as an example, ready to unleash Brazil's potential in navigating a sustainable energy transition that aims to keep the average global temperature rise below 2° C.

A testament to RCGI's commitment to pioneering solutions is the world's first plant to produce renewable hydrogen from ethanol. This pilot

facility is scheduled to become operational in July 2024, with a yield of 4.5 kg of hydrogen per hour. Should this pioneering endeavor prove successful, it will pave the way for even greater strides in collaboration with industry partners.

In conclusion, RCGI's unwavering dedication to sustainability, innovation, and climate action puts it at the forefront of efforts to address the pressing challenges of our time. As it continues to push boundaries and forge global partnerships, it serves as an example of hope for a more sustainable and resilient future.

RESEARCH AREAS

1. Nature-Based Solutions (NBS)
2. Carbon Capture and Utilization (CCU)
3. Bioenergy Carbon Capture and Storage (BECCS)
4. Greenhouse Gas (GHG)
5. Advocacy
6. Innovation Power Systems
7. Decarbonization

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RESEARCH HIGHLIGHTS

World's first hydrogen-from-ethanol plant will be built at University of São Paulo

The project is the result of a partnership between FAPESP and Shell, and could help make hydrogen a widely used fuel in Brazil. Hydrogen from a pilot plant to be built at USP using Raízen's ethanol will power buses on the campus.

Deforestation in Indigenous Territories caused emission of 90 million metric tons of CO_2

Scientists analyzed data for the period from 232 Indigenous Territories in Brazil. Results published in Scientific Reports shows deforestation rates accelerating between 2019 and 2021.

Studies on carbon storage supported by FAPESP contributed to legislative proposal

Results of studies conducted at the Research Center for Greenhouse Gas Innovation (RCGI) have fed into a bill before the Senate to set up a legal framework on carbon capture and storage as an economic activity.

SÃO PAULO ADVANCED RESEARCH CENTER FOR BIOLOGICAL CONTROL (SPARCBIO)

Goal: To develop a biological pest control model for tropical regions through competitive international research

Coordinator: José Roberto Postali Parra

Host Institution: Luiz de Queiroz College of Agriculture, University of São Paulo (ESALQ-USP)

Business partner: Koppert Biological Systems

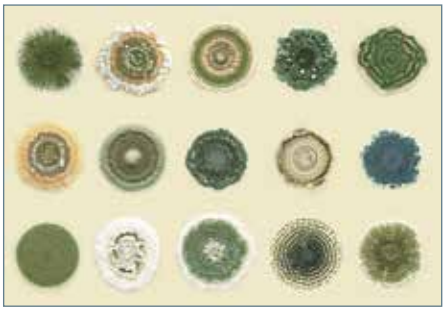

Photo: Koppert

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FAPESP Process 2018/02317-5
Term: Oct 2019 to Sep 2024

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SPARCBio is the result of a partnership between FAPESP and Koppert Biological Systems, a Dutch-based company, to support high-level scientific research for the development of sustainable agricultural technologies.

The center is hosted at ESALQ-USP. The research effort also involves professors from other Brazilian universities (such as UNESP, UFSCar, UFES, and UFV), researchers from Embrapa, and partners from the United States (Department of Agriculture, Agricultural Research Service, University of California Davis, and University of Minnesota), France (Institut National de la Recherche Agronomique, and Sophia Antipolis), and Denmark (University of Copenhagen).

The group aims to develop research projects, products and technologies that will result in a strong relationship with a novel integrated approach to pest management in modern and sustainable agriculture. Its main challenge is to change Brazilian farmers' views about the competitiveness and environmental benefits of biotechnology.

Interaction with the educational system, especially primary and secondary schools, is also expected to disseminate information on biological pest control through the FAPESP Public Education Research Program.

RESEARCH AREAS

1. Find new control biological agents.
2. Develop new technologies.
3. Advance knowledge of integrated pest and disease management.

RESEARCH HIGHLIGHTS

FAPESP and Koppert launch the São Paulo Advanced Resarch Center for Biological Control in Agriculture

Hosted by the University of São Paulo in Piracicaba (ESALQ-USP), SPARCBio will develop a new integrated pest management model to foster the sustainability of tropical agriculture.

GENOMICS FOR CLIMATE CHANGE RESEARCH CENTER (GCCRC)

Goal: To develop biotechnological solutions, using gene editing and plant-associated microbiomes, to ensure agriculture sustainability to face the threat of global climate change

Coordinator: Paulo Arruda
Host Institution: Center for Molecular Biology and Genetic Engineering, State University of Campinas (CBMEG-UNICAMP)
Business partner: Brazilian Agricultural Research Company (Embrapa)

Photo: GCCRC

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FAPESP Process 2016/23218-0
Term: Aug 2018 to Jul 2028

FAPESP and EMBRAPA have been partners in the Genomics for Climate Change Research Center (GCCRC) at the University of Campinas since 2017.

The center develops biotechnological solutions to increase plant resistance to drought and heat. The technologies developed by GCCRC will be made available to the agribusiness sector for trait development and commercial use.

GCCRC uses biotechnological tools such as genetics, genomics gene targeting, genetic engineering, genome editing and microbiome assessment, organized in a robust pipeline, to improve crop performance under abiotic stress due to climate change.

The research program is built on a platform called "From Gene to Trait", which uses modern bioinformatics and computational tools to interrogate omics data from various sources in search of novel genes, pathways and microbes to develop biotechnology traits. To understand in greater depth the functional role of genes and microbes in plant performance under abiotic stress, GCCRC has developed in-house tools for real-time advanced plant phenotyping, allowing assessment of plant abiotic stress responses in both greenhouses and field trials.

The physiological parameters for evaluating drought stress tolerance are validated by high-resolution data and imaging. The advanced laboratory has light/temperature-controlled growth rooms designed for maize transformation, plant regeneration, and acclimation of transformed plants.

Using state-of-the-art tools, its researchers have elucidated how microorganisms help control plant water flow and drought tolerance, paving the way for new agricultural biotechnologies that can guarantee food security during the transition to a low-carbon economy.

RESEARCH HIGHLIGHTS

Microbes could be used by farmers as natural fertilizer for poor soil

A study shows that archaea, bacteria and fungi found in campos rupestres, a Brazilian ecoregion with low-fertility soil, are essential sources of plant nutrients. Products originating in the discovery could be used in future as substitutes for chemical phosphate fertilizer.

Brazilian soybean growers' use of biofertilizer is highlighted by a leading science journal

According to the article, Brazil has had more success than any other country with the use of biofertilizer to provide nitrogen for soybeans. The inoculation of microorganisms into the soil boosts yields, reduces greenhouse gas emissions, and saves some USD 10 billion per year in imports of synthetic fertilizer.

Protein involved in corn's water stress response discovered

The protein, which is involved in the mechanism of the plant's response to water and thermal stresses and to invasion by fungi, has been named DRIK1. It could help develop drought-resistant plant varieties and products that reduce losses related to climate change.

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Research projects supported in the Center

CENTER FOR PLANT MOLECULAR BREEDING (CPMB)

Goal: Development of genetic resources to increase agricultural production

Coordinator: Anete Pereira de Souza
Host Institution: Center for Molecular Biology and Genetic Engineering, State University of Campinas (CBMEG-UNICAMP)
Business partner: Brazilian Agricultural Research Corporation (EMBRAPA)

Access the website

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FAPESP Process 2022/04006-2
Term: Dec 2022 to Nov 2032

BV-FAPESP
Research projects supported in the Center

CPMB is a partnership involving UNICAMP, EMBRAPA, the Agronomic Institute (IAC) and the Federal University of São Carlos (UFSCar/RIDESA), in collaboration with four other national institutions. It has 61 researchers from a Brazilian company, seven local institutions and 11 foreign institutions. It aims to revolutionize the study of complex genomes, creating the foundations for a profound transformation in agricultural varieties of global relevance.

Its multidisciplinary team develops and advances innovative, state-of-the-art methods and best practices to sustainably maximize genetic gains in sugarcane (*Saccharum spp.*) and forage grasses used in pastures (*Urochloa spp.*, *M. maximus* and *Paspalum spp.*).

The genetic improvement of these species is an enormous challenge and requires investment in cutting-edge research due to their polyploidy and heterozygous nature. Sugarcane is the main candidate crop for the production of bioenergy and biomaterials, while tropical forage grasses are the basis for livestock feed and subsequently for the production of beef and milk. Sugarcane and forage grasses occupy the first and second positions among the activities that contribute most to agribusiness revenue in São Paulo State.

In addition to creating new approaches to improve agricultural production in the São Paulo State and throughout Brazil, CPMB aims to offer its expertise to other regions with similar environmental conditions around the world, extending Brazil's influence on international research. With long-term financial support, CPMB will significantly advance complex genome research and breeding of target species, creating a unique position in low-input agricultural systems, and promoting food and nutritional security in a more sustainable way.

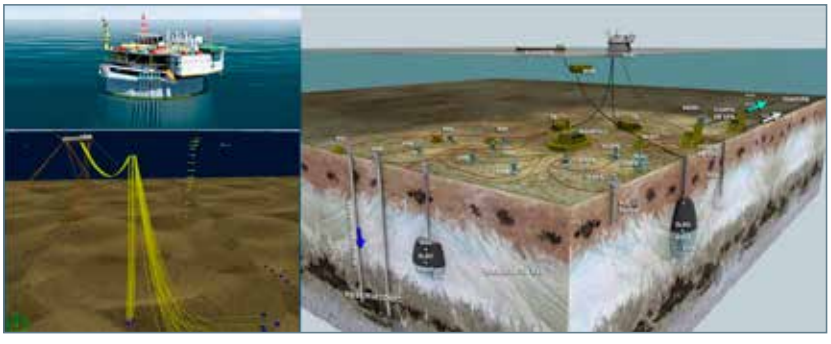
RESEARCH AREAS

1. Molecular Omics;
2. High-Throughput Phenotyping;
3. Modeling;
4. Data Science.

OFFSHORE TECHNOLOGY INNOVATION CENTRE (OTIC)

Goal: To develop knowledge and innovation for decarbonization and digitalization of all offshore processes and sustainable development of the oceans

Coordinator: Kazuo Nishimoto
Host Institution: School of Engineering,University of São Paulo (POLI-USP)
Business partner: Shell Group



Credit: OTIC_Scope Assi Kazuo 2023

OTIC develops ocean surface and subsea systems that give impetus to the technological development necessary for the "offshore of tomorrow", focusing on decarbonization of energy production in the ocean and digitalization to guarantee the safety of offshore operations.

OTIC is the newest FAPESP ERC in partnership with Shell Brazil. Other industry partnerships are possible to generate innovation and technologies for the "offshore of tomorrow".

The Center was born out of a strong partnership between the University of São Paulo (USP) and the São Paulo State Institute for Technological Research (IPT).

It has five programs and 24 projects in a matrix format. Its multidisciplinary approach will advance the knowledge necessary for the energy transition in current offshore oil and gas production and the new era of renewable energies without greenhouse gas emissions.

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FAPESP Process 2022/03698-8
Term: Nov 2022 to Oct 2027

BV-FAPESP
Research projects supported in the Center

RESEARCH AREAS

1. NPO – New Processes and Operations
2. LCP – Low-Carbon Power
3. DGT – Digital Transformation
4. NMT – Novel Materials and Nanotechnology
5. HSE – Health, Safety, Environment and Circular Economy

CENTER FOR INNOVATION IN NEW ENERGIES (CINE)

Goal: To generate knowledge and create capacity for the energy transition

Business partner: Shell Group Brazil

Photo: CINE

CINE was launched by FAPESP, UNICAMP, USP and IPEN on May 23, 2018 with the aim of developing technologies for clean energy conversion and storage, as well as sustainable routes for the production of green fuels and other chemicals.

CINE has four research divisions, where a total of 20 projects are carried out. The members perform research at the frontier of knowledge. In parallel, the center works to transfer technology to the business sector through patent licensing, partnerships and startups.

In five years, CINE has made important scientific contributions to energy transition and decarbonization, from the development of scientific instrumentation to study electrochemical reactions to the production of green hydrogen using solar energy, as well as the manufacturing of batteries based on emerging technologies. Other important advances have been made in equipment and catalysts for greenhouse gas conversion into chemicals.

CINE's achievements are reflected in more than 420 published papers, 10 patent applications, and more than 200 students and postdocs trained in the field of new energies.

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Division 1 – Dense Energy Carriers

Coordinator: Ana Flavia Nogueira | anafla@unicamp.br
Host institution: Institute of Chemistry, State University of Campinas (IQ-UNICAMP)

FAPESP Processes 2017/11986-5 | Operation period: Aug 2018 to Jul 2028

Division 2 – Advanced Energy Storage

Coordinator: Rubens Maciel Filho | rmaciel@unicamp.br
Host institution: School of Chemical Engineering, State University of Campinas (FEQ-UNICAMP)

FAPESP Processes 2017/11958-1 | Operation period: Aug 2018 to Jul 2023

Division 3 – Computational Materials Science and Chemistry

Coordinator: Juarez Lopes Ferreira da Silva | juarez_dasilva@iqsc.usp.br
Host institution: São Carlos Institute of Chemistry, University of São Paulo (IQSC-USP)

FAPESP Processes 2017/11631-2 | Operation period: Aug 2018 to Jul 2028

Division 4 – Methane to Products (M2P)

Coordinator: Fabio Coral Fonseca | fabiocf@usp.br
Host institution: Nuclear and Energy Research Institute (IPEN)

FAPESP Processes 2017/11937-4 | Operation period: Aug 2018 to Jul 2025

RESEARCH HIGHLIGHTS

Researchers explore strategies to convert CO_2 into value-added products for industry
One of the goals of the study conducted by scientists at the Center for Development of Functional Materials and the Center for Innovation in New Energies is to reduce atmospheric emissions of this greenhouse gas.

FAPESP-supported research center develops ammonia production process with high energy efficiency
Annual production of NH3, the world's most synthesized molecule, totals 1.2 million metric tons. Its successful use in fuel cells will boost demand.

New theoretical model paves way for more efficient supercapacitor
The new model is capable of providing a realistic analysis of the experimental data for a supercapacitor in which internal energy losses are considered.

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Research projects supported in the Center Division 1

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Research projects supported in the Center Division 2

BV-FAPESP
Research projects supported in the Center Division 3

BV-FAPESP
Research projects supported in the Center Division 4

ENGINEERING RESEARCH CENTER IN ARTIFICIAL INTELLIGENCE (C4AI)

Goal: To produce advanced basic and applied research in artificial intelligence, and to disseminate and transfer its results and technology

Coordinator: Fabio Cozman
Host Institution: University of São Paulo (Poli/USP)
Business partner: IBM Brazil

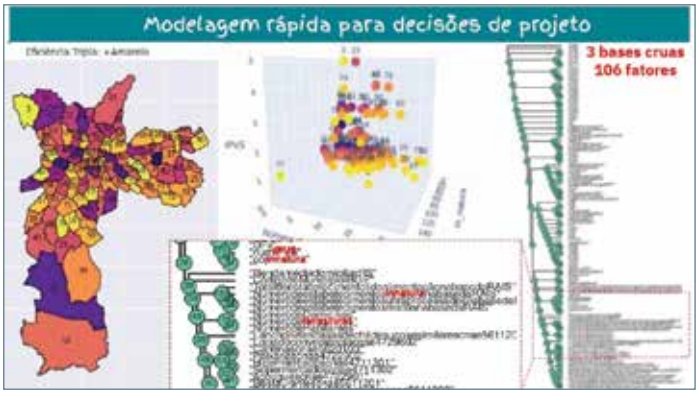

Photo: Alexandre Delbem/USP

The Center for Artificial Intelligence USP/IBM/FAPESP (C4AI) is an Engineering Research Center launched in 2020. It is headquartered at InovaUSP, a space for multidisciplinary research and innovation at the University of São Paulo (USP), in the city of São Paulo. Other spaces are located on USP's campuses in São Carlos, Ribeirão Preto and Piracicaba. It also partners with the Aeronautics Institute of Technology (ITA), the Pontifical Catholic University of São Paulo (PUC-SP) and Ignatian Educational Foundation (FEI).

The center's mission is to produce advanced research in artificial intelligence in Brazil, disseminate and debate its main results, train students and professionals, and transfer the technology to society. Its vision is to be a world-class center of excellence in artificial intelligence and an essential organization for the scientific community and society in Brazil.

Its research activities are organized around challenges that combine fundamental aspects of artificial intelligence with applications in selected fields.

c4ai.inova.usp.br

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FAPESP Process 2019/07665-4
Term: Aug 2020 to Jul 2025

RESEARCH AREAS

1. Resources and tools for Brazilian languages (Portuguese and Indigenous languages);
2. Physics-based machine learning and decision making for climate and ocean prediction;
3. Knowledge-enhanced machine learning for conversational agents;
4. Assessments of the state of artificial intelligence and its impact on society.

RESEARCH HIGHLIGHTS

Scientists create model to predict depression and anxiety using artificial intelligence and social media

A study by a group at the University of São Paulo reported in a scientific journal on a study involving the construction of a database and models. Preliminary results are described in the article.

Artificial intelligence improves shipping forecasts in port areas

A technology created by the University of São Paulo's Center for Artificial Intelligence increases the accuracy of shipping and other weather forecasts by 20%, and is being tested at the Port of Santos.

Tool uses artificial intelligence in support of decisions on actions to combat hunger

Algorithms developed at the University of São Paulo interpret information from different databases and help identify city areas susceptible to food insecurity.

BV-FAPESP
Research projects supported in the Center

ENGINEERING RESEARCH CENTER ON PLANT HEALTH IN SUGARCANE (Cepenfito)

Goal: To develop basic and applied research on integrated management of sugarcane pests and diseases

Coordinator: Odair Aparecido Fernandes

Host Institution: School of Agricultural and Veterinary Sciences, São Paulo State University (FCAV-UNESP)

Business Partner: São Martinho Group

Photo: Cepenfito

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FAPESP Process 2014/50279-4
Term: Aug 2021 to Jul 2026

BV-FAPESP
Research projects supported in the Center

Cepenfito is a center for advanced research in integrated management of sugarcane pests and diseases. It focuses on scientific, technological and innovative development for agribusiness, via excellence, interdisciplinarity and integration with the formation of intellectual capital and technological extension, in a transparent, ethical, and committed manner.

The center is headquartered at FCAV-UNESP in Jaboticabal, and receives funding through an agreement between FAPESP and São Martinho S/A, one of the largest sugar-energy groups in Brazil. It is an inter-institutional center that partners with researchers from nine research and extension institutions: São Paulo State University (UNESP Jaboticabal, Botucatu and Sorocaba); Agronomic Institute – Sugarcane Center (IAC); Federal University of São Carlos (UFSCar); University of São Paulo (USP); University of Franca (UNIFRAN); University of Sorocaba (UNISO); and Dr. Francis Maeda School of Agronomy (FAFRAM). UNESP's foundation for research, teaching and extension is a partner in administrative management. It currently has 36 researchers.

It also disseminates scientific knowledge through educational materials, continuing education courses for teachers, and activities for basic education and the lay public in general, including news, podcasts, and technical and informative videos in the media.

Another goal is to exchange technology with the sugarcane sector, based on professional training and field days; demonstrate technologies, services, processes and products; exchange knowledge with students, researchers, professionals and farmers; and train development multipliers in plant protection and integrated pest management. Outreach programs will be supported through the Agroindustrial Cooperative (COPLANA).

RESEARCH AREAS

1. Biology and mass rearing of insects;
2. Production and formulation of entomopathogens;
3. Pest management tactics;
4. Phytopathogens.

BRAZILIAN CENTER FOR APPLIED RESEARCH ON EARLY CHILDHOOD (CPAPI)

Goal: Foster equal opportunities for children aged 0 to 6 years

Coordinator: Naercio Aquino Menezes Filho
Host Institution: INSPER Business School
Business partner: Maria Cecilia Souto Vidigal Foundation

Photo: Léo Ramos Chaves

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FAPESP Process 2019/12553-0
Term: Oct 2021 to Sep 2031

CPAPI has the mission of generating and disseminating knowledge, through scientific evidence, for the formulation of public policies aimed at the healthy development of children aged 0 to 6 years. It receives funding from FAPESP through an agreement with the Maria Cecilia Souto Vidigal Foundation and is hosted by INSPER in São Paulo.

It is also the result of the "Science for Childhood" initiative whereby several institutions are promoting quality of life improvements during early childhood. The institutions are: Bernard van Leer Foundation, Harvard University's Center on the Developing Child and David Rockefeller Center for Latin American Studies, Porticus Latin America, and the University of São Paulo's Medical School (FM-USP), in addition to the Maria Cecilia Souto Vidigal Foundation and INSPER.

CPAPI's projects encompass the development and transfer of technologies for monitoring child development indicators to support public policies. The center is evaluating the impact of a policy to increase information about the Child Health Handbook (CSC) to medical staff on its use to measure child development in public health centers.

CPAPI also promotes courses for professionals in the health, education and social assistance sectors on the importance of child development, parenting, families, educational content and public policies on early childhood.

On another front, the center is following a new cohort of newborns in the city of Ribeirão Preto to collect DNA and mental health indicators. The babies of this cohort will be followed over time, and the center will measure their development in several ways, such as quality of sleep, brain image and mother-child interactions, among others.

RESEARCH HIGHLIGHTS

The importance of early childhood
Researchers create methodology for calculating federal budget allocated to children aged six and under in Brazil

Newborns to three months should be stimulated to hold and reach for objects, research suggests
According to a recently published study, when newborns observe adults performing everyday tasks, their social, motor and cognitive development is stimulated.

FAPESP launches Brazilian Center for Early Child Development
The new Applied Research Center's mission is to conduct research that can provide input for public policies. FAPESP is partnering with the Maria Cecilia Souto Vidigal Foundation and INSPER to mount the initiative.

BV-FAPESP
Research projects supported in the Center

PLASTICULTURE ENGINEERING CENTRE (CEP)

Goal: To create disruptive technologies and adapt existing plastic solutions in food security, overcoming barriers linked to socioeconomic megatrends and climate change

Coordinator: Telma Teixeira Franco
Host Institution: Center for Energy Planning, University of Campinas (NIPE-UNICAMP)
Business partner: Braskem

Photo: Braskem

Access the website

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FAPESP Process 2021/05251-8
Term: Feb 2023 to Jan 2028

CEP is a multidisciplinary center that brings together experts from different areas, such as forestry, organic food production, protected cultivation of vegetables and fruits, technical-economic analysis, aquaculture, polymer science, recycling, circular economy, reverse logistics and design. Its goal is to develop, modify and validate disruptive plasticulture solutions that improve product performance and adapt existing plastic solutions for different crops, addressing specific problems.

With the support of FAPESP and Braskem, a global petrochemical company, the center will develop solutions that reduce costs, surmount barriers imposed by climate change, ensure food security, and verify that products placed on sale are healthy. Research will be conducted in close collaboration with agricultural producers and associations.

Its immediate goals include optimization of inputs and natural resources for food production, such as water, reducing agriculture's environmental impact, and raising yields in order to meet demand from consumers.

Studies will be conducted to adapt solutions in polyethylene, polypropylene and PVC for use in crop covering, protected seedling preparation, storage of seeds in plastic silos, and packaging to protect food products during transportation to cities. Another research line will be development of new materials for storage and transportation of soybeans and other grain crops.

CEP is already promoting several education and dissemination actions, such as education on plasticulture for graduate students and the podcast "O Plástico é Agro".

RESEARCH AREAS

1. Disruptive solutions;
2. Modification and validation of existing plastic solutions to be applied in areas such as grains, vegetables, organics, forestry and tilapia farming.

RESEARCH HIGHLIGHTS

FAPESP and Braskem create center for research on use of plastics in agriculture

The new Engineering Research Center will be led by scientists affiliated with the University of Campinas's Interdisciplinary Center for Energy Planning, in partnership with colleagues at universities and research institutions in São Paulo State, Brazil.

BV-FAPESP
Research projects supported in the Center

SMART NETWORKS AND SERVICES FOR 2030 (SMARTNESS)

Goal: To explore innovative telecommunications solutions that help design and build cloud computing infrastructures and cognitive networks to support connected services and applications for industry and society.

Coordinator: Christian Esteve Rothenberg

Host Institution: School of Electrical and Computer Engineering, State University of Campinas (FEEC-UNICAMP)

Business partner: Ericsson

Photo: SMARTNESS

SMARTNESS aims to conduct cutting-edge research in computer networks and digital application services for strategic areas in which scientific and technological advances can be achieved by the year 2030, in collaboration with cloud and networking research communities. With the deployment of 5G and 6G under development, the main challenges for SMARTNESS are how to design and operate cloud computing infrastructures and networks with adequate capabilities to leverage the next generation of internet services and applications.

The center aims to explore well-planned opportunities through an appropriate methodology designed to drive world-class research and innovation through scientific and technological advancements to address challenging use cases in internet scenarios for industry and society with a vision for the year 2030.

SMARTNESS aims to become an internationally recognized center of excellence in cloud/networking research and engineering and a key participant in collaborative projects with other FAPESP ERCs hosted by UNICAMP, USP or UFSCar.

SMARTNESS plans to become a key living lab on the connectivity and edge computing front-end of the International Hub for Sustainable Development (HIDS) currently under design in Campinas, São Paulo State, contributing to sustainable development through innovative technologies and education of future generations, where pervasive, affordable networking and computing resources are expected to help to mitigate the social, economic and environmental fragilities of present-day society. Going forward, world-class research at the knowledge frontier in networking and cloud computing toward 6G will complement the Science and Technology Park's infrastructure offered by INOVA, UNICAMP's innovation agency, providing an incubation facility for innovative start-ups and spin-offs requiring the engineering skills and distributed network and compute testbed laboratory supplied by SMARTNESS for 5G and beyond.

smartness2030.tech

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FAPESP Process 2021/00199-8
Term: Apr 2023 to Mar 2033

SMARTNESS builds upon UNICAMP's successful research collaboration with the networking ecosystem, especially with Ericsson worldwide, and in São Paulo through the research branch in Indaiatuba, where highly qualified researchers are developing advanced network architectures and protocols, as well as artificial intelligence.

The international presence and impact of our results in talent building, open- source software for research and education, standardization and intellectual property assets , among others, makes us internationally competitive in research on networking and cloud systems.

We plan to go beyond state-of-the-art networked system disciplines by focusing on the following five areas of scientific and technological advancement.

RESEARCH AREAS

1. SUS: Sustainability;
2. TRU: Trustworthiness: Security, Privacy, Safety, Ethics;
3. CA: Cognitive Architectures;
4. FCD: Fluid Control & Data Planes.

RESEARCH HIGHLIGHTS

FAPESP launches Engineering Research Centers with Embraer, Ericsson and GSK
Projects will focus on future aerial mobility, digital networks and services, and immuno-onco

BV-FAPESP
Research projects supported in the Center

ENGINEERING RESEARCH CENTER FOR THE AERIAL MOBILITY OF THE FUTURE (FLYMOV)

Goal: To conduct high-quality research on innovative topics with the potential to contribute to the competitiveness of Brazil's aerospace industry in the coming decades

Coordinator: Domingos A. Rade
Host Institution: Aeronautics Institute of Technology (ITA)
Business partner: Embraer

Photo: ITA

Launched by FAPESP in 2023, FLYMOV is a world-class research center comprising Embraer as a high-technology company and a team of distinguished researchers from ITA, UNICAMP and the University of São Paulo's São Carlos School of Engineering (EESC-USP). We also collaborate closely with institutions abroad. We offer adequate outstanding research infrastructure and human resources for the long-term, far-reaching investigations needed to overcome the challenges to aerial mobility in the coming decades.

The main challenges are the need to reduce air pollution and noise, increase efficiency, and make manufacturing and fabrication processes more environmentally friendly, as well as the growing demand for novel aircraft adapted to operate in urban environments and for short-range travel.

Other important goals include training highly qualified researchers, knowledge transfer to industrial companies, and diffusion of knowledge to other sectors of society.

Five research lines will be the focus for the first phase of FLYMOV, each involving a team of researchers from academic institutions and engineers from Embraer, with strong participation by undergraduates, graduate students and post doctoral fellows. The total number of researchers is around 130.

Given the complexity and diversity of research topics, FLYMOV is regarded by its partners as an efficient and sustainable means of conducting long-term, highly challenging R&D projects to build the aerial mobility of the future.

www.flymov.com.br

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FAPESP Process 2021/11258-5
Term: Jan 2023 to Dec 2027

RESEARCH AREAS

1. Machine Control for Electric Propulsion;
2. Aeropropulsion Integration in Electric Aircraft;
3. Methods for Decision Making in Autonomous Systems;
4. Advanced Design for Metallic Additive Manufacturing;
5. Intelligent Aircraft Final Assembly.

RESEARCH HIGHLIGHTS

Engineering Center for Aerial Mobility of the Future starts operating

Established by FAPESP and Embraer at the Aeronautical Technology Institute (ITA), ERC-AMF will conduct research on innovative topics with the potential to contribute to the competitiveness of Brazil's aerospace industry.

BV-FAPESP
Research projects supported in the Center

CENTRE OF EXCELLENCE FOR RESEARCH ON SUSTAINABLE CHEMISTRY (CERSUSCHEM)

Goal: To develop sustainable synthetic methods employing benign solvents, safer reagents, and bio-renewable feedstock

Coordinator: Arlene Gonçalves Corrêa

Host Institution: Center of Exact Sciences and Technology, Federal University of São Carlos (UFSCar)

Business partner: GlaxoSmithKline Brasil Ltda (GSK)

Photo: CERSusChem

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FAPESP Process 2014/50249-8
Term: Apr 2016 to Apr 2022

BV-FAPESP
Research projects supported in the Center

CERSusChem was part of the Engineering Research Centers Program (CPE) between 2016 and 2022. Since May 2022, it has been funded by a FAPESP Thematic Project.

Its research staff comprises nine faculty members of UFSCar with ongoing projects in the area and with well-established national and international research collaborations.

The team's expertise ensures continuous production at the state of the art to address a series of challenges and overarching goals as long-term directions of its research activities. The research features novel strategies from across pharma, biotech and academia to meet current challenges in organic synthesis. It focuses on the principles of sustainable chemistry, including cascade organocatalytic/multicomponent reactions, nanomaterials, solvent-free approach or biosolvents, biocatalysis, flow chemistry, and new models for protein ligand assays.

The education and knowledge dissemination action plan calls for training of qualified industry workers and secondary school teachers. Technology transfer is another important part of our mission, requiring collaborative work with industrial partners pursued in a flexible manner in order to meet their needs. We are also developing a tool box for catalytic reactions and assays, leading to practical applications in the manufacturing of new or well-established products with environmental and economic benefits while advancing social well-being.

ENGINEERING RESEARCH CENTER PROF. URBANO ERNESTO STUMPF

Goal: state-of-the-art, multidisciplinary and complex research relating to internal combustion engines

Coordinators: Waldyr Luiz Ribeiro Gallo – 1st Phase
Francisco Emílio Baccaro Nigro – 2nd Phase

Host institutions: Biofuel Engine Laboratory, State University of Campinas (LMB-UNICAMP) – 1st Phase;
Mauá School of Engineering, Mauá Institute of Technology (EEM-IMT) – 2nd Phase

Business partner: Stellantis (former PSA Group)

Photo: CPE Prof. Urbano Ernesto Stumpf

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FAPESP Process 2013/50238-3
Term: Nov 2014 to Oct 2022

The Professor Urbano Ernesto Stumpf ERC was part of the Engineering Research Center Program (CPE) between 2014 and 2022. It was funded by FAPESP and Peugeot-Citroën (PSA, now part of Stellantis) and hosted by UNICAMP's Biofuel Engine Laboratory (1st phase) and IMT's Mauá School of Engineering. It involved scientists from the University of São Paulo (USP), Aeronautics Institute of Technology (ITA), Institute Mauá of Technology (IMT), and State University of Campinas (UNICAMP).

The team covered a comprehensive range of technical subjects relating to biofuel engines, from basic physical and chemical phenomena to the entire vehicle. The first phase (2014-2019) focused on basic phenomena, including a conceptual study of an advanced ethanol-fueled engine. The second phase (2019-2022) focused on the fine tuning of 1D and 3D simulation tools, and their application to ethanol engines.

This ERC also trained researchers for academic and industrial activities, and to establish technical and scientific collaboration among research groups and the industry.

More recently, it coordinated testing of the latest generation of engines developed by the group, and designed a methodology for 3D computer simulation of fluid dynamics (CFD) in internal combustion engines running on ethanol. The research team also characterized ethanol combustion in a single-cylinder optical engine and identified several key factors that modify the injection and combustion behavior of ethanol compared to gasoline.

RESEARCH AREAS

1. Exploratory experimental tests for an ethanol engine.
2. Fundamental studies on mixture preparation and turbulent combustion of ethanol in engines.
3. Spray Combustion of Hydrated Ethanol for MPFI Engines
4. Thermodynamic simulation of indicated performance for ethanol engines.
5. Simulation of DI ethanol spray behavior and combustion evolution via 3D CFD, with models validated against experimental results.

RESEARCH HIGHLIGHTS

Stumpf Engineering Research Center helps orient Stellantis's decisions on ethanol in Brazil
The automotive giant resulting from the PSA-Fiat Chrysler merger is partnering with FAPESP in this ERC, which is integrated with Stellantis's global network of science labs.

Less-polluting cars
The R&D Center of the PSA Group in Brazil works to improve ethanol engines and develop parts made with recyclable materials.

BV-FAPESP
Research projects supported in the Center

CENTERS OF ARTIFICIAL INTELLIGENCE

PARTNERS:

Ministry of Science, Technology and Innovation (MCTI)

Ministry of Communications (MCom)

Internet Steering Committee in Brazil (CGI.br)

In 2013, FAPESP signed an agreement worth BRL 98 million with Ministry of Science, Technology and Innovation (MCTI), Ministry of Communications (MCom) and Internet Steering Committee in Brazil (CGI.br) to support scientific and technological research projects that contribute to the development of the internet in Brazil.

The amount corresponds to the remaining resources from the period between 1998 and 2005 in which FAPESP, by delegation of the Internet Steering Committee in Brazil, managed domain registration and IP address allocation activities.

The funding is to be distributed among projects presented by researchers across the country, in proportion to the number of domain registrations requested by each state in that period.

CENTERS OF ARTIFICIAL INTELLIGENCE

PARTNERS:

Ministry of Science, Technology and Innovation (MCTI)

Ministry of Communications (MCom)

Internet Steering Committee in Brazil (CGI.br)

Reference Center on Artificial Intelligence – CEREIA

Goal: using artificial intelligence to solve problems in the healthcare sector, as well as promoting the training of professionals to serve this market

Coordinator: José Soares de Andrade Júnior
Host Institution: Federal University of Ceará (UFC)
Other partners: HAP Vida Assistência Medica Ltda, Pontifical Catholic University of Rio de Janeiro (PUC-RIO), Federal University of Piaui, University of Fortaleza, and Ceará Foundation for Scientific and Technological Development (Funcap)

FAPESP Process 2020/09706-7
Term: Mar 2023 to Feb 2028

BV-FAPESP
Research projects supported in the Center

The center's research focuses on the internet of things (IoT), big data, digital transformation and cutting-edge technologies in disease prevention, diagnosis and low-cost therapies. The center also aims to foster discussions about the effects of this technology on teaching, research and extension.

There are six priority lines:

1. prediction of chronic diseases;
2. support for the evaluation of radiological examinations;
3. patient engagement in health promotion and chronic disease prevention programs;
4. intelligent system for remote patient monitoring;
5. anamnesis assisted by artificial intelligence and high-quality interfaces for data science in healthcare.

CENTERS OF ARTIFICIAL INTELLIGENCE

PARTNERS:

Ministry of Science, Technology and Innovation (MCTI)

Ministry of Communications (MCom)

Internet Steering Committee in Brazil (CGI.br)

Center of Excellence in Applied Research on Artificial Intelligence for Industry

Goal: to implement an open digital data science and artificial intelligence platform for industry 4.0

Coordinator: Antônio José da Silva Neto / Davidson Martins Moreira

Host Institution: Manufacturing and Technology Integrated Campus, SENAI CIMATEC, Salvador, Bahia

FAPESP Process 2020/09770-7
Term: Mar 2023 to Feb 2028

BV-FAPESP
Research projects supported in the Center

This ERC aims to leverage the modernization, competitiveness, and scientific and technological development of the Brazilian industry by accelerating and popularizing the application of AI, and to help the Brazilian government provide a digital environment for Industrial Artificial Intelligence (I-AI), as a basis for the modernization of production processes and the generation of new knowledge-intensive businesses.

The development of this platform will be fostered by a network of researchers who will share their knowledge in integrated and interdisciplinary research projects. The integration of AI skills and experiences in this network will contribute to a national plan for education and knowledge dissemination, with the training of qualified human resources.

All of these activities will lead to the creation of innovative products and intellectual property, generating patents and registered software, promoting technology transfer and seeking to create innovative opportunities for sustainable and ethical industrial development.

CENTERS OF ARTIFICIAL INTELLIGENCE

PARTNERS:

Ministry of Science, Technology and Innovation (MCTI)

Ministry of Communications (MCom)

Internet Steering Committee in Brazil (CGI.br)

Artificial Intelligence in the Remaking of Urban Environments – IARA

Coordinator: André Carlos Ponce de Leon Ferreira de Carvalho
Host Institution: Institute of Mathematical and Computer Sciences, University of São Paulo (ICMC-USP)

FAPESP Process 2020/09835-1
Term: Aug 2023 to Jul 2028

BV-FAPESP
Research projects supported in the Center

IARA has a multidisciplinary team of researchers including experts in artificial intelligence, internet of things (IoT), telecommunications, and smart cities. Hosted in São Carlos, São Paulo State, it networks with researchers from all Brazilian regions, collaborating with researchers from several scientific, technological and innovation institutions in São Paulo, including all public universities.

The team aims to cover five aspects of smart cities:

1. cybersecurity
2. education
3. infrastructure
4. environment
5. health

CENTERS OF ARTIFICIAL INTELLIGENCE

PARTNERS:

Ministry of Science, Technology and Innovation (MCTI)

Ministry of Communications (MCom)

Internet Steering Committee in Brazil (CGI.br)

Innovation Center for Artificial Intelligence in Health – CIIA-Health

Coordinator: Virgilio Augusto Fernandes Almeida
Host Institution: Institute of Exact Sciences, Federal University of Minas Gerais (ICEx-UFMG)

FAPESP Process 2020/09866-4
Term: Aug 2023 to Jul 2028

BV-FAPESP
Research projects supported in the Center

The focus of CIIA-Saúde is the research and development of artificial intelligence techniques and solutions for self-care, to assist health professionals in the diagnosis and treatment of diseases, and to help health managers plan preventive actions and care, while optimizing the use of resources and broadly improving the health of the Brazilian population.

It is a multidisciplinary and multi-institutional center integrating STEM and health areas. It is based at UFMG and partners with nine higher education institutions in the Southeast, South and North regions of the country, as well as four companies in the areas of health, technology and education.

The team consists of 130 researchers, who work on the following five fronts:

1. disease prevention and improvements to the quality of life.
2. diagnosis, prognosis and screening
3. therapeutics and personalized medicine.
4. health systems and management
5. epidemics and disasters.

CENTERS OF ARTIFICIAL INTELLIGENCE

PARTNERS:

Ministry of Science, Technology and Innovation (MCTI)

Ministry of Communications (MCom)

Internet Steering Committee in Brazil (CGI.br)

Center for Applied Research in Artificial Intelligence for the Evolution of Industries to Standard 4.0

Coordinator: Jefferson de Oliveira Gomes
Host Institution: Institute for Technological Research (IPT) / São Paulo State Department of Economic Development

FAPESP Process 2020/09850-0
Term: Mar 2023 to Feb 2028

BV-FAPESP
Research projects supported in the Center

Hosted by IPT, the center has eight founding industrial partners, and 85 researchers from Brazilian universities and research institutes. Seven research institutions and universities sit on its international council, and it is run by a management committee comprising specialists from the sector and academia.

Its mission is to develop technologies for the implementation of artificial intelligence on an industrial scale in cooperation with the network of partners.

It will build an artificial intelligence platform to enable the acceleration and digitalization of Brazilian industry, conducting R&D, executing proofs of concept and installing demonstration plants. The process will also involve knowledge diffusion and technology transfer integrated into an innovation ecosystem.

The research projects are guided by the challenges of the industries on six major themes:

1. Monitoring and Control in Real-Time;
2. Digital Twin;
3. Interoperability and Chain Integration;
4. Prescriptive Maintenance and Intelligent Operation;
5. Autonomous Systems, Robotics, and Machine Tools;
6. Cybersecurity.

CENTERS OF ARTIFICIAL INTELLIGENCE

PARTNERS:

Ministry of Science, Technology and Innovation (MCTI)

Ministry of Communications (MCom)

Internet Steering Committee in Brazil (CGI.br)

Brazilian Institute of Data Science – BI0S

Coordinator: João Marcos Travassos Romano
Host Institution: School of Electrical and Computer Engineering, State University of Campinas (FEEC-UNICAMP)

FAPESP Process 2020/09838-0
Term: Sep 2023 to Aug 2028

BV-FAPESP
Research projects supported in the Center

BI0S aims to develop state-of-the-art solutions in data science and artificial intelligence (AI), solving relevant problems and connecting academia, companies, startups, society and the public sector in an integrated innovation ecosystem. It will contribute to scientific, technological and social development, addressing problems that originate in multi-stakeholder interactions.

BI0S fosters entrepreneurship and startup culture, which helps bring its ideas to market. It also promotes initiatives for the dissemination of knowledge on data science and AI, aiming at attracting young talents from high school and early college years, as well as providing continuous education opportunities for professionals. At first, BI0S will focus on two strategic areas:

1. Health
2. Agriculture