

# Research

The Software/Hardware Integration Lab (LISHA) at the Federal University of Santa Catarina has been doing research related to [Application-driven Embedded System Design](#) (ADESD) and the [Embedded Parallel Operating System](#) (EPOS) since 2001. Currently, the following research lines are actives:

- [Computer Networks](#)
- [Operating Systems](#)
- [Computer Architecture and Organization](#)
- [Embedded and Cyber-Physical System Design](#)

## Projects

- [AutoAAI — AI Agents for Optimized Vehicle Assistance](#) (2026-2029): Rota 2030
- [AutoSF — Responsible and Intelligent Fleet Management](#) (2026-2029): Rota 2030
- [AutoSM — Optimized Vehicle Assistance](#) (2026-2029): Rota 2030
- [AutoDL — Secure and Privacy-Aware Data Lake for Vehicle Data Storage and Processing](#) (2024-2027): Rota 2030
- [Auto5G — Intelligent Vehicle Telemetry and Supervision System](#) (2023-2026): Rota 2030
- [IASE — Intelligent Acquisition and Analysis System for ECUs](#) (2021-2025): Rota 2030
- [SDAV — SmartData for Autonomous Systems](#)
- [OBNZip — Intelligent Seismic Data Compressor for OBNs](#) (2022-2026): Petrobrás/ANP
- [SmartData IoT Platform](#) (2017- )

## Finished Projects

- [INCANTO PrINT: IoT for Smart Manufacturing](#) (2019-2024): CAPES
- [MoHear: Models for Hearing Aids and Cochlear Implants](#) (2018-2020): CAPES
- [EUBrasilCloudFORUM: Fostering an International dialogue between Europe & Brazil](#) (2016 - 2017): CTIC/RNP
- [Multi-campus Hydrological Monitoring](#) (2015 - 2017): FEESC/FUNJAB/UFSC
- [Smart Solar Building](#) (2014 - 2018): CNPQ
- [IP-Sense: Secure Motion Detection Sensors for Building Automation](#) (2014-2016): FAPEU/Khomp
- [Porting EPOS to Intel's Galileo](#) (2014 - 2015)
- [Space-SoC: On-board Computer for Space Applications](#) (2010 - 2012): Brazilian Space Agency (AEB)
- [Architecture Communication ICIP60](#) (2010 - 2012): FAPEU/Intelbrás
- [Corporate Video Conferencing](#) (2010 - 2011): FAPEU/Intelbrás
- [OS support for WSN and Embedded System Debugging](#) (2011 - 2013): CAPES/DFAIT
- [FlexES: Flexible Embedded Systems](#) (2010 - 2013): CNPq
- [eSDR: Embedded Software-defined Radio](#) (2009 - 2013): Dígítro
- [CIA<sup>2</sup> Building Smart Cities: from Environmental Instrumentation to Application Deployment](#) (2011 - 2013): CTIC, National Network on Smart Cities
- [RH-TVD: Special Graduate Program for Digital TV](#) (2009 - 2012): CAPES
  - ICs, Hardware and Firmware for DTV (UFRGS)
  - DSP and Embedded Systems (UNICAMP)
- [Rede ALTATV: an Open, Free, Scalable Set-top Box Architecture for DTV and IPTV](#) (2009 - 2010): CTIC, National Network on Smart Cities
- [Rede H.264 SBTVD](#) (2008 - 2010): FINEP, UFRGS
- [H.264 Encoder: Design and Implementation of a H.264 Encoder for the ISDTV](#) (2008 - 2011): FINEP/CiaNET
- [IPTV STB: Design and Implementation of a Set-top Box for IPTV](#) (2008 - 2009): FAPESC
- [UnderNET: Underground Energy Distribution Network Monitoring System](#) (2007 - 2008): ANEEL/CELESC
- [SAM: Layered Scalable Video Codec](#)(2006 - 2008): FINEP, UFRGS

- [PMM: Modular Multimedia Platform](#) (2006 - 2008): FINEP, UFRGS
- [PDSCE: Embedded System Development Platform](#) (2005 - 2007): FINEP, PUC-RS, UFSM, UFRGS
- [SBTVD: Brazilian Digital Television System](#)
  - [MIDIASUL: Transport Layer](#) (2005 - 2006): FINEP, PUC-Rio
  - [CODECSUL: Scalable Codec](#) (2005 - 2006): FINEP, UNISINOS
- [I2TV: Interactive TV for Internet2](#) (2002 - 2004): CNPq, UFPB, USP
- [SNOW: Scalable Network of Workstations](#) (2001 - 2004): CNPq / BMBF, TU-Berlin, FhG FIRST, UEN
- [ParaBioInfo: Parallel Applications in Bioinformatics](#)(2003 - 2004): CNPq, FioCruz
- [AutoFlash: Software Update in Automobiles](#) (2002 - 2003): FAU
- [Centro Integrado Multidisciplinar de Pesquisas em Bioinformática de Santa Catarina](#) (2002 - 2003): CNPq
- [DESS: Software Development Process for Real-time Embedded Software Systems](#) (1999 - 2001): ITEA/BMBF
- [Application-Oriented System Design](#) (1997 - 2001): UFSC /CAPES/GMD-FIRST
- [Aboelha: a Nano-kernel to Support Dynamic Parallel Objects](#) (1993 - 1996)
- [Pyxis: a Distributed File System](#) (1992-1994): CNPq
- [3D Visualization of Magnetic Markers in Noninvasive Gastrointestinal Transit Monitoring](#) (1992): PTB / DAAD

## Publications