

Research, Development and Innovation

The Hardware and Software Integration Lab (LISHA) develops a series of projects in partnerships with private companies and public agencies in the areas of embedded systems design, telecommunications and digital TV.

Automotive Systems

LISHA develops a number of projects involving partnerships with several automotive industry players, and has an expertise in the areas of architectures for automotive systems, from software embedded at ECUs to automotive data lakes, including, data acquisition and storage, predictive maintenance, driver profiling, and autonomous vehicles.

Projects

- [SmartData on Wheels — a Safe and Secure Runtime Support System for Autonomous Vehicles](#) (2023 -)
- [AutoSF — Responsible and Intelligent Fleet Management](#) (2026 - 2029): MOVER with Stellantis, Mobilis, IAV, Trackli, and Mobway
- [AutoSM — Optimized Vehicle Assistance](#) (2026 - 2029): MOVER with Stellantis, Mobilis, IAV, Trackli, and Mobway
- [AutoDL — Secure and Privacy-Aware Data Lake for Vehicle Data Storage and Processing](#) (2024 - 2027): MOVER with Renault, Stellantis, Bosch
- [AutoAAI - AI Agents for Optimized Vehicle Assistance](#) (2026-2028): MOVER with Stellantis, Intelbras, and ES2 Tech
- [Auto5G — Intelligent Vehicle Telemetry and Supervision System](#) (2023 - 2026) : MOVER with Intelbras and Yak
- [IASE — Intelligent Acquisition and Analysis System for ECUs](#) (2020 - 2026): MOVER with Renault

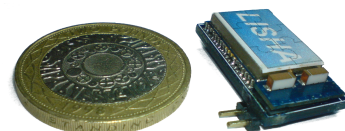


Embedded Systems Design

LISHA investigates the use of [ADESD](#) methodology for developing embedded systems. This methodology proposes the use of advanced engineering technics for building systems based on the use of components highly adapted to the execution scenario, thus facilitating their reuse. Currently the laboratory has a set of components (EPOS Project) for the implementation of applications in areas as sensor networks, home automation, remote data acquisition, telecommunication and digital video entertainment devices.

Projects

- [EPOS: Embedded Parallel Operating System](#) (1997 -)
- [PDSCE: Embedded System Development Platform](#) (2004 - 2007)
- [SmartHome](#) (2009 - 2015)
- [EPOS-Mote](#) (2009 - 2016)
- [FlexES: Flexible Embedded Systems](#) (2010 - 2012)



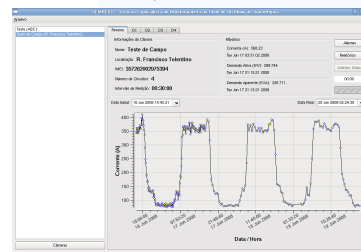
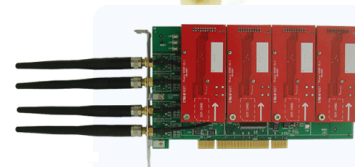
Telecommunication

LISHA develops a number of projects involving partnerships with local telecommunications companies, and has an expertise in the areas of architectures for telecommunication systems, communication GPRS / GSM, VoIP services (audio and video) and software-defined radio architecture.

Projects

- [ADEG-Hydro: Anomaly Detection in Hydroelectric Energy Generators](#) (2021)

- 2023) : AQTech
- ADEG-Eolic: Anomaly Detection in Eolic Energy Generators (2020 - 2021) : AQTech
- [Architecture Communication ICIP60](#) (2009 - 2012): Intelbras
- [Corporate Video Conferencing](#) (2010 - 2011): Intelbras
- [eSDR: Embedded Software-defined Radio](#) (2009 - 2010): Dígistro
- UnderNET: Underground Energy Distribution Network Monitoring System (2007 - 2008): CELESC
- Serial Terminal GSM (2007): vOffice
- Gateway GSM (2007): Khomp
- NanoPBX (2007): vOffice



Digital Television

LISHA has actively participated in the consortium of academic institutions that studied the proposal for the definition of Brazilian Digital Television Standard (SBTVD), and directly contributed to the studies of the Transport Layer and encoding of audio and video. Currently LISHA represents the UFSC on the SBTVD Forum and participate on the research network on DTV Set-top box proposing an free, scalable and open architecture for DTV STB.

Projects

- [Rede ALTATV: an Open, Free, Scalable Set-top Box Architecture for DTV and IPTV](#) (2009 - 2010): CTIC
- [H.264 Encoder: Design and Implementation of a H.264 Encoder for the ISDTV](#) (2008 - 2011): FINEP / CiaNET
- [RH-TVD: Special Graduate Program for Digital TV](#) (2009 - 2012): CAPES
- [Rede H.264 SBTVD](#) (2008 - 2010): FINEP
- IPTV STB: Design and Implementation of a Set-top Box for IPTV (2008 - 2009): FAPESC
- SAM: Layered Scalable Video Codec (2006 - 2008): FINEP
- PMM: Modular Multimedia Platform (2006 - 2008): FINEP
- [SBTVD: Brazilian Digital Television System](#) (2005 - 2006): FINEP
- [I2TV: Interactive TV for Internet2](#) (2002 - 2004): CNPq

