Advanced Center
for Electrical and Electronic Engineering

UNIVERSIDAD TECNICA
FEDERICO SANTA MARIA

MOTIVATION

CHILEAN ECONOMY
Strongly based on the explotation of natural resources

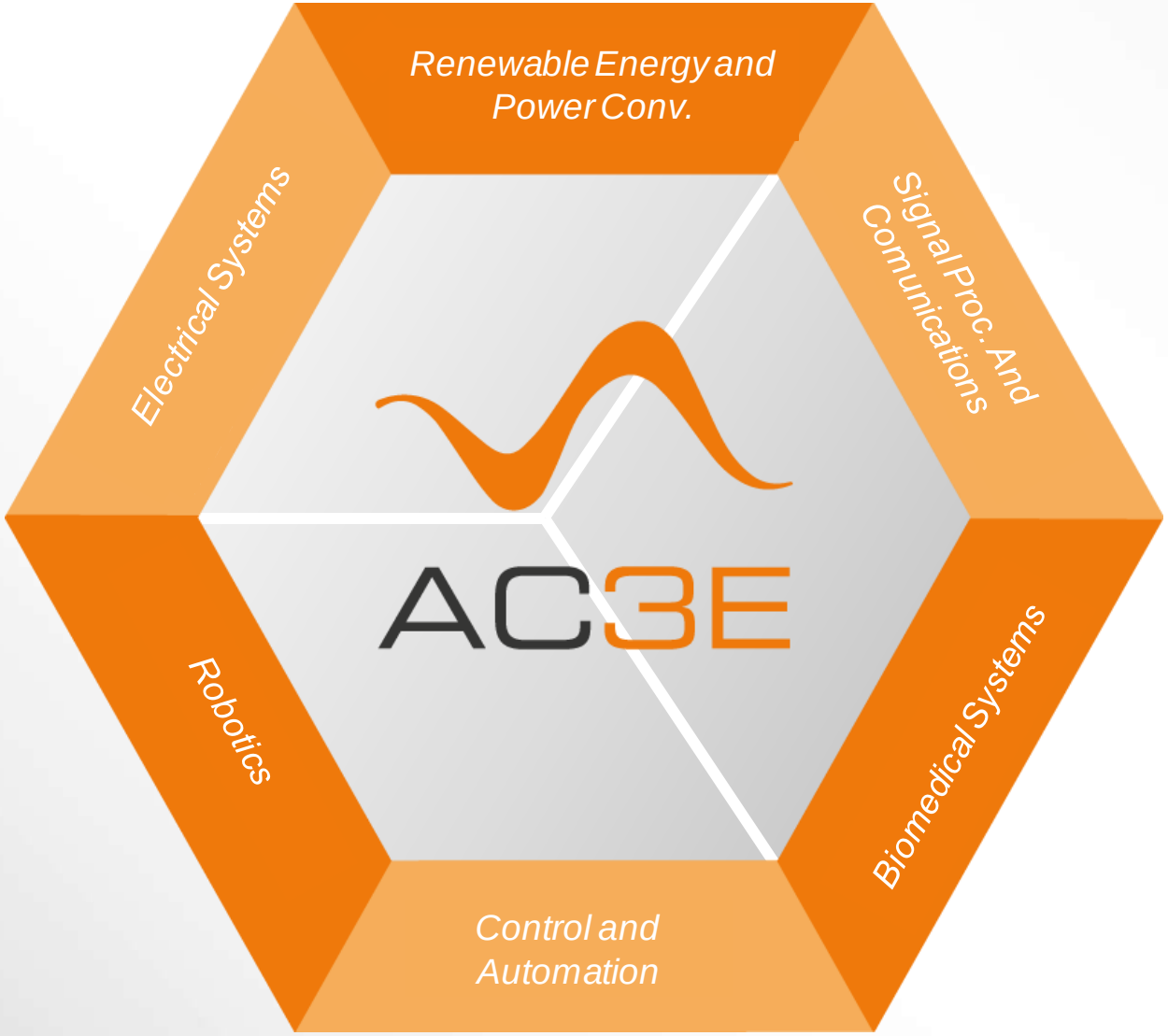
CHILEAN TECHNOLOGY INDUSTRY
Few success stories (not widespread)

MISSING LINK
Between university and industry

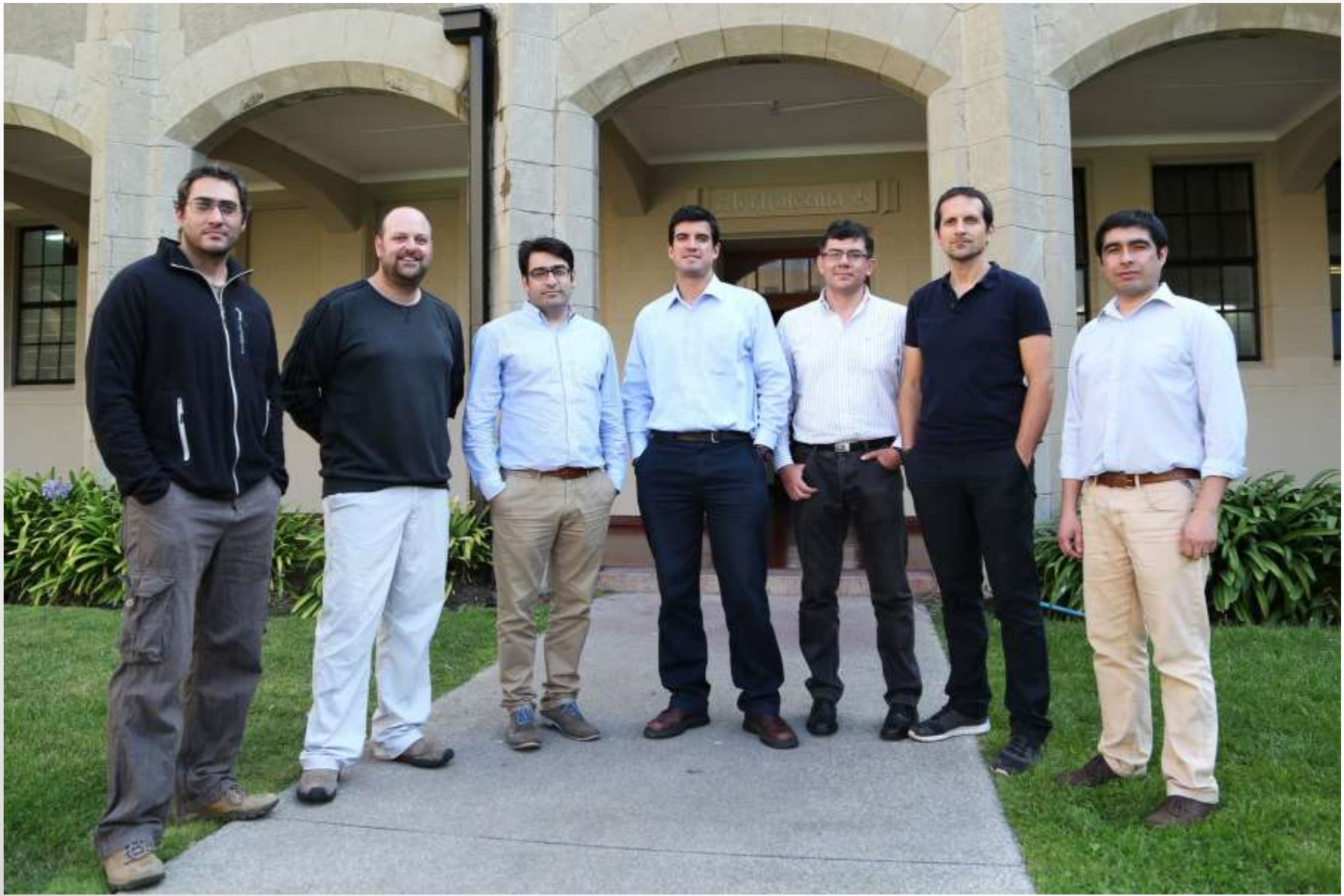
OUR MISSION

To contribute to the technological development and competitiveness of the Chilean economy by achieving excellence in **RESEARCH**, forming advanced human resources, and fostering **INNOVATION** and **TECHNOLOGY TRANSFER** in areas of societal and industrial impact through the field of **ELECTRICAL AND ELECTRONICS** engineering

WHO WE ARE


Renewable Energy and Power Conv.
Signal Proc. And Communications
Biomedical Systems
Control and Automation
Robotics
Electrical Systems
AC3E

PRINCIPAL INVESTIGATORS



ROBOTICS

Dr. Fernando Auat Cheein
ROBOTICS

Miguel Torres-Torriti, Ph.D
ROBOTICS
(Ph.D. Electrical Engineering (Systems and Control), McGill University)

Pablo Prieto, Ph.D
PRODUCT DESIGN
(Doctor of Philosophy (PhD), Brunel University, England)

Luis Pérez
MECHANICS
(Doctor in Mechanical Engineering, UTFSM, Chile)

Ronny Vallejos, Ph.D
STATISTICIAN
(Ph. D. in Statistics, University of Maryland Baltimore County, USA)

ENERGY

Christian Rojas
POWER ELECTRONICS
(Ph.D. in Electronics Engineering, UTFSM, Chile)

Samir Kouro
RENEWABLE ENERGY
(Dr. Universidad Técnica Federico Santa María, Chile)

José Rodríguez
POWER ELECTRONICS
(Dr. Erlangen University, Germany)

Marcelo Pérez
HVDC SYSTEMS
(Dr. Universidad de Concepción, Chile)

Roberto Cardenas
MACHINE CONTROL
(Ph.D. in Electrical and Electronic Engineering, University of Nottingham)

BIOMEDICAL SYSTEMS

Matías Zañartu
BIOMEDICAL ACOUSTICS
(Ph.D., Electrical and Comp. Eng., Purdue University, USA)

María José Escobar
COMPUTATIONAL NEUROSCIENCE
(Ph.D. in Sciences, Université de Nice-Sophia Antipolis, France)

Alejandro Weinstein
BIOMEDICAL SIGNAL PROCESSING
(Ph.D, Electrical Eng, Colorado School of Mines, USA)

Patricio Orio
BIOMEDICAL SIGNAL PROCESSING
(Dr. en Ciencias, U. de Chile)

Wael El-Deredy
BRAIN DYNAMICS
(PhD Neurocomputing, Institute of Neurology, University College London, UK)

CONTROL AND AUTOMATION

Juan I. Yuz,
SAMPLED-DATA MODELS
(Ph.D., U. of Newcastle, Australia)

Eduardo Cerpa
CONTROL OF PDEs
(Ph.D, Université Paris-Sud, France)

Marcos Orchard
PROGNOSIS AND HEALTH MANAGEMENT
(Ph.D. Georgia Tech, USA)

Alejandro Rojas
NETWORKED CONTROL SYSTEMS
(Ph.D, U. of Newcastle, Australia)

Juan C. Agüero,
SYSTEM IDENTIFICATION ,
(Ph.D, U. of Newcastle, Australia)

Francisco Vargas,
NETWORKED CONTROL SYSTEMS (Ph.D, UTFSM, Chile)

Rodrigo Carvajal,
COMMUNICATION CHANNEL MODELING, (Ph.D, U. of Newcastle, Australia)

ELECTRICAL SYSTEMS

Pablo Lezana
POWER ELECTRONICS
(D. Ingeniería Electrónica, Universidad Técnica Federico Santa María, Chile)

Esteban Gil
POWER SYSTEMS AND RENEWABLE ENERGY
(Dr. Iowa State University, USA)

Victor Hinojosa
OPERATION AND PLANIFICATION OF ELECTRIC SUPPLY SYSTEMS
(Dr. Universidad Nacional de San Juan, Argentina)

Francisco Muñoz
ECONOMIC PLANNING OF POWER SYSTEMS
(Ph.D. Energy Economics and Operations Research, The Johns Hopkins University, USA)

Gonzalo Carvajal
SPECIALIZED COMPUTING AND EMBEDDED SYSTEMS
(Ph.D in Electrical Engineering, Universidad de Concepcion, Chile)

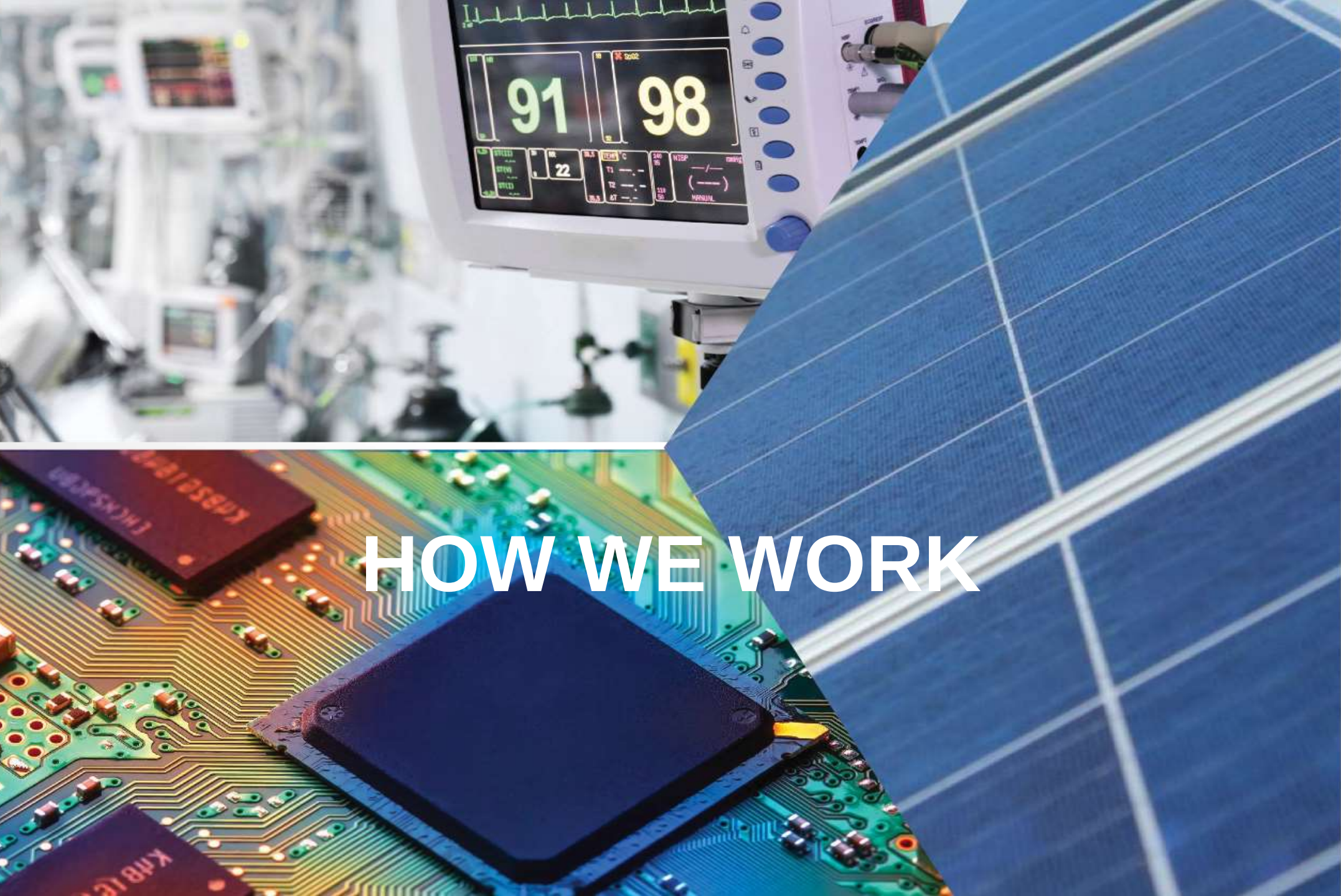
SIGNAL PROCESSING AND COMMUNICATIONS

Milan S. Derpich
SIGNAL PROCESSING NETWORKED CONTROL
(Dr. Univ. Of Newcastle, Australia)

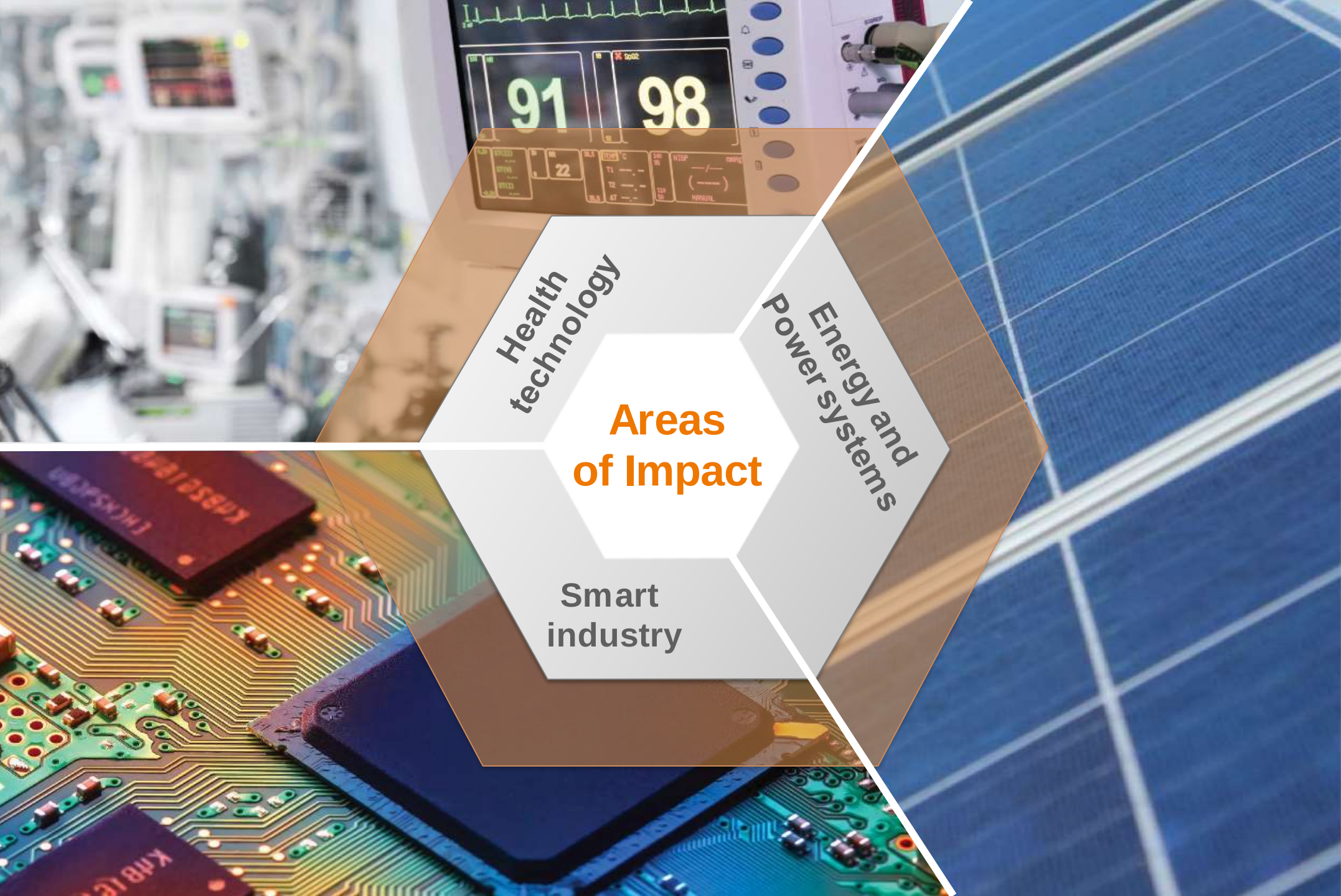
Mauricio Araya
DISTRIBUTED DATA ACQUISITION
(PhD en Informática, INRIA-Université de Lorraine, Francia)

Jorge F. Silva
SIGNAL PROCESSING, STATISTICAL INFERENCE
(Dr. Univ. South California, EEUU)

Luciano Ahumada
SIGNAL PROCESSING,
(Dr. Ing. Eléctrica y Electrónica , UTFSM)

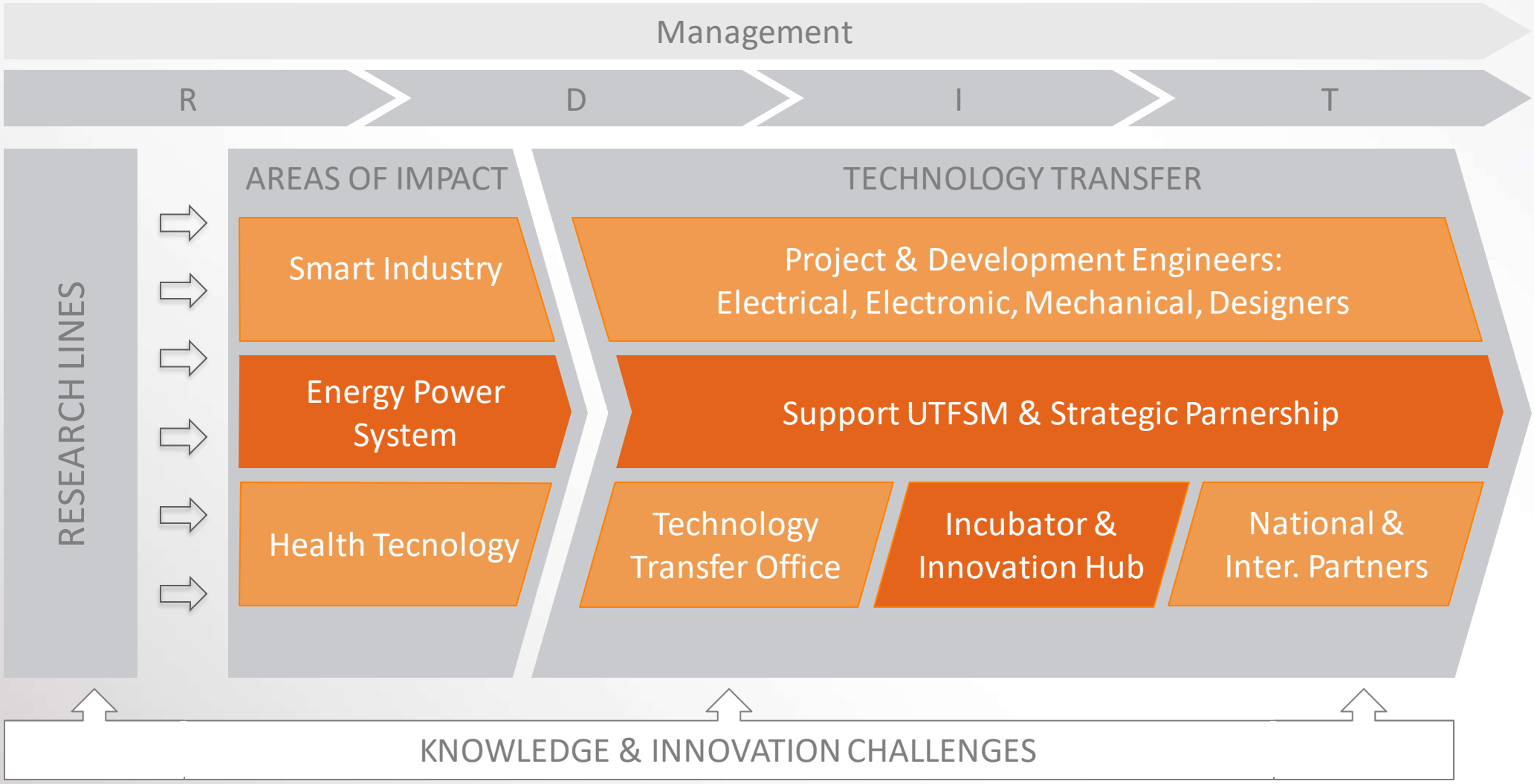


HOW WE WORK


Areas of Impact
Health technology
Energy and Power systems
Smart industry

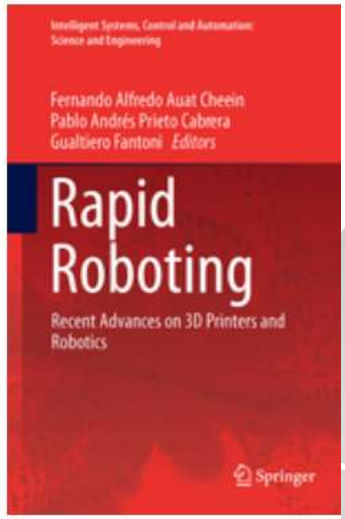
HOW WE WORK

Research, Development, Innovation and Transfer



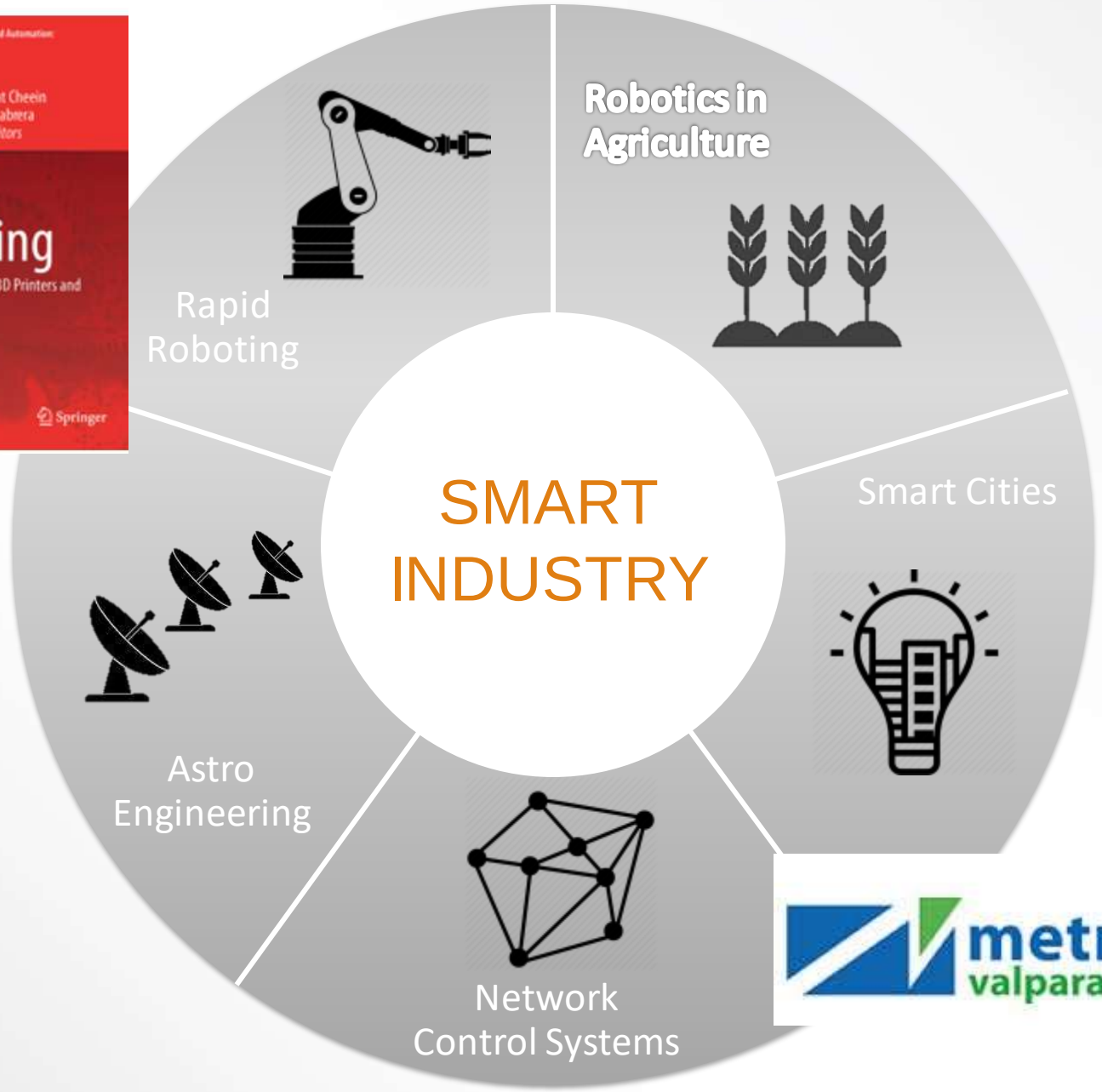
IMPACT AREAS:

SMART INDUSTRY



RESEARCH: The Rapid Roboting concept (Springer, 2017)

PROJECT: Metro Valparaiso line simulator to optimize train timetable based on passengers arrival.

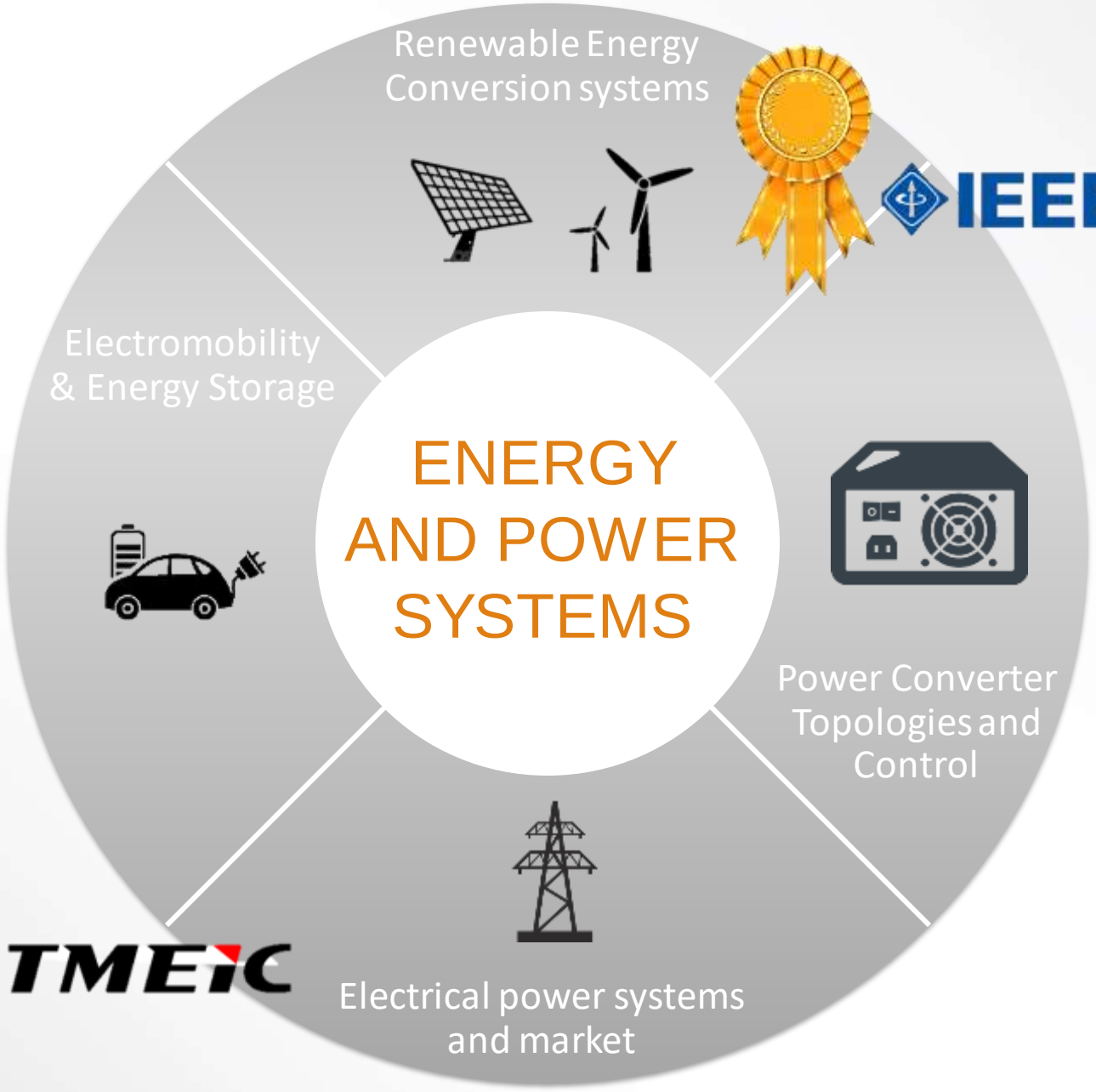


IMPACT AREAS:

ENERGY AND POWER SYSTEMS

RESEARCH: 2015 IEEE IES David Irwin Award for "multilevel converter technology and application to renewable energy conversion systems".

PROJECT: TMEIC. Analysis, modeling and simulation of Samurai Photovoltaic inverter and its interaction to the utility grid, in the Chilean power system

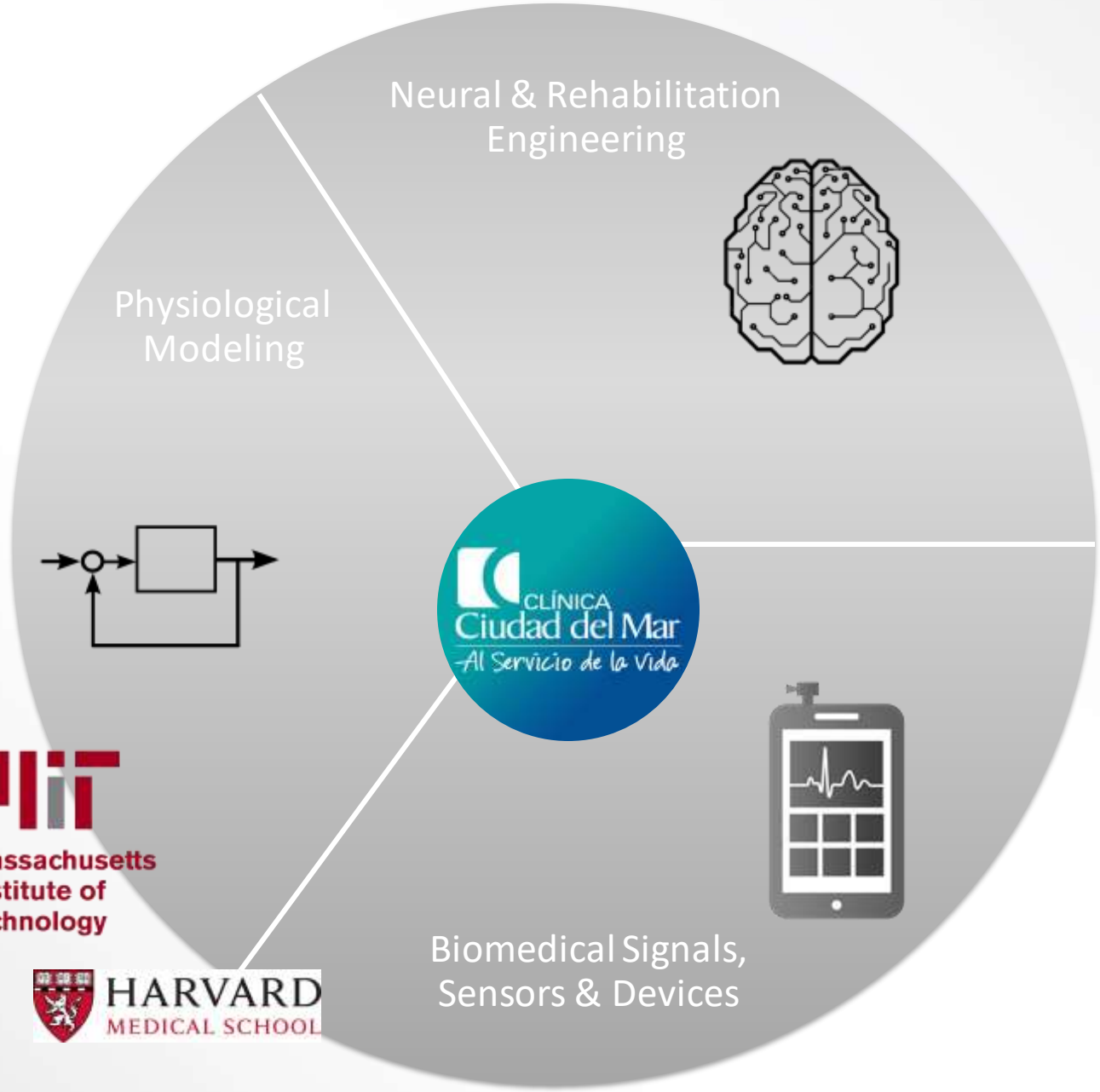


IMPACT AREAS:

HEALTH TECHNOLOGY

PROJECT: CCdM.
Biomedical sensing to detect obstructive sleep apnea in children through recordings of neck surface acceleration.

RESEARCH: NIH R01, R21, and P50 research proposals.
R21 recently funded.
P50 highly ranked, resubmitted in 2016.



CAPABILITIES FOR DEVELOPMENT

Human Resources

- **31 researchers** / 6 Research Lines
- **5 Development engineers and technicians** / electric and y electronic.
- **>80 undergraduates and postgraduates students** eventually involved in projects with industry

Infrastructure

- **12 laboratories availables**
- **1 development laboratory for academics an industrial projects.**
- **First class instrumentation y equipment**

Background

- **Industrial:** 10 currently projects and >20 finished.
- **20 research projects**
- **Design an prototyping** for innovation projects.
- **Advisory and training** in electric and electronic





+30 Active cooperation partners
GLOBAL NETWORK

WORLD-CLASS RESEARCH FOR WORLD CLASS CHALLENGES

Advanced Center
for Electrical and Electronic Engineering

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