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ARGEMIP Infoday

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* as of *May 2024*





CENTERS AND FORUMS



FACULTY OF ENGINEERING AND NATURAL SCIENCES



FACULTY OF ARTS AND SOCIAL SCIENCES



SABANCI BUSINESS SCHOOL



Research Development and Technology Transfer Office (SUATT) MISSION & KEY FUNKTIONS



Mission:

To foster innovation and entrepreneurship by bridging research projects with industry needs and facilitating technology transfer.



SUATT STRATEGIC GOALS



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SUATT SERVICES





Industry Cooperation



Joint R&D Project Development Services





Intellectual Property and Commercialization



Industrial Services



Enterprise Europe Network Services

SUATT PROJECT DEVELOPMENT MODEL



SUATT TECHNOLOGY TRANSFER MODEL

Project



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ACHIEVEMENTS and SUCCESS STORIES



Externally Funded Projects by 2023-2024

Year	Funding Org.	Call Code	Call Name		TOTAL BUDGET	
	AB	ERC	ERC-2024-StG	60		
2024	AB	HORIZON EUROPE	HORIZON-CL3-2023-CS-01-02: Privacy-preserving and identity management technologies	36		
	AB	HORIZON EUROPE	IORIZON-CL4-2024-TWIN-TRANSITION-01-05			
	AB	HORIZON EUROPE	HORIZON-MSCA-2023-CITIZENS-01	22		
	AB	DIGITAL Europe	DIGITAL-2023-SKILLS-05— CYBERACADEMY	36		
	AB	HORIZON EUROPE	HORIZON-CL5-2024-D5-01	42	≈6.5 M €	
	AB	HORIZON EUROPE	HORIZON-HLTH-2022-IND-13-2	36		
	Khalifa University	2D Call	2D Call	36		
2023	AB	HORIZON-JTI-CLEANH2-2022-06-02	Hydrogen Valleys (small-scale)	60		
	AB	ERC	ERC-2023-StG	60		
	AB	HORIZON EUROPE	HORIZON-CL5-2023-D5-01-08: Accelerating climate neutral hydrogen powered/electrified aviation	48		

Licensed Technologies by 2022-2023

Year of Licensing	Technology	Type of Licensing
2022	A Product For Preventing And Recovering Oxidative Damage in Living Cells	ТИВІТАК 1702
2022	Mekanik Özellikleri İyileştirilmiş Polimer Bazlı Kompozit Malzeme	ТИВІТАК 1702
2022	Makarnalık Buğday Tohumları (DURUSA ve MİRSA)	T.C. Orman Bakanlığı Sakarya Mısır Araştırma Enstitüsü Project
2023	A Method of Advance Purification of Waste Polyolefins	Direct Licensing
2022	A Polymer Matrix Based Superabsorbent Material	Spin-Off Licensing
2022	Method for Highly Thermally Conductive Hexagonal Boron Nitride Reinforced PEEK Composites with Adjustable Melt Flow by Scalable Compounding	Licensing of Mutually Owned Patent



This section will be explained in a separate presentation.

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FOCUS AREAS IN RESEARCH



ROBOTICS

Research Areas

- Computer Vision,
- Control Systems,
- Robotics
- Intelligent Motion Control,
- Humanoid Robots,
- Industrial Robotics,
- Force Control
- Control of Dynamic Systems,
- Soft Robotics

Faculty Members: Mustafa Ünel, Kemalettin Erbatur, Melih Türkseven

Applications include but not limited to:

- Autonomous driving,
- Predictive maintenance,
- Motion/gait analysis,
- Unmanned Aerial Vehichles,
- Structural health monitoring (SHM)
- Robotic manufacturing











ROBOTICS

Research Areas

- Artificial Intelligence
- Knowledge Representation and Reasoning
- Cognitive Robotics
- Physical Human-Robot Interaction,
- Rehabilitation Robotics
- Bilateral Teleoperation
- Haptic Interfaces and ForceFeedback
 Exoskeletons
- Human Motor Control and Learning
- Human-Friendly Service Robotics

Faculty Members: Esra Erdem, Volkan Patoğlu



Human Machine Interaction Laboratory http://hmi.sabanciuniv.edu

Applications:

- Haptic interfaces for manual skill training,
- Teleoperators for exploration of hazardous or remote environments,
- x-by-wire systems for automotive/aerospace industry,
- Service robots for collaborative task execution with humans etc.



MACHINING

Research Areas

- Manufacturing Engineering
- Machining Processes
- Machine Tools
- Machine Dynamics
- Robotic Manufacturing,
- CAD-CAM,
- Micromachining and Micro/Nanofabrication Technologies

Faculty Members: Erhan Budak, Lütfi Taner Tunç, Murat Kaya Yapıcı







MEMS (Microelectromechanical System)

Research Areas

- Micromachining and Micro/Nanofabrication Technologies,
- Micro Sensors and Actuators,
- Semiconductor Process Technologies,
- Scanning Probe-based Nanotechnology and Nanomanufacturing,
- Biomedical Microsystems and Devices,
- Microfluidic Systems,
- MEMS-CMOS
- Nanomaterial Integration

Applications in **biomedical sciences**, electronics and nanotechnology

Faculty Members: Murat Kaya Yapıcı, Ali Koşar, Gözde İnce

- VLSI Design for Analog/Digital Sensor Interfaces
- Microelectromechanical System (MEMS) Modeling and Design
- Medical Instrumentation (sensor and sensor interface design)
- Acoustic Microscopy (material characterization, lens design)



Faculty Member: Ayhan Bozkurt



DATA SCIENCE

Research Areas

- Data security
- Cryptography
- Communications
- Data analysis
- Computer visualization
- Security and privacy
- High performance computing
- Machine Learning







SU INC SABANCI UNIVERSITY INTEGRATED MANUFACTURING TECHNOLOGIES RESEARCH AND APPLICATION CENTER







Certification & Accreditation



AS9100 Certification



TS EN ISO/ IEC 17025 Accreditation

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Capabilities:

Design and Computational Mechanics

- Composite Design and Analysis
- Variable Stiffness Composite Design
- Computational Fluid Dynamics
- Impact / High Strain Rate Problems
- Crashworthiness









Capabilities: **Advanced Composite** Manufacturing

- Thermoset and thermoplastic composite parts,
- Autoclave, Oven, RTM, Press, Vacuum Infusion manufacturing,
- Sandwich part manufacturing
- Automated Fiber Placement Manufacturing









Capabilities:

Automated Fiber Placement Machine:

- Thermoset (Infra-red heater)
- Thermoplastic (Laser)
- Dry fabric (Laser)



CLOSED ROOM

LASER SAFETY

OPERATOR ACCE:

DOOR (8x5.8m) AND ROOF (8x4m) FOR LOADING MOLD





Capabilities:

Out-of-Autoclave Process for Carbon Prepreg Laminates:

- Integrated Modeling and Optimization
- Experimental verification of production methods
- Void fraction less than 1%





Capabilities: **Robotic Machining**:

- Water Jet Routing Robot (3750 bar)
- 5 Axis Machining Robot
- Polymer Additive 3D Manufacturing Robot





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Capabilities: **Additive Manufacturing:**

- EOS Selective Laser Melting Machine
- DMG Mori Lasertec 3D Hybrid Process Machine
- Heat Treatment Furnace
- Sandblasting
- Deposition and Machining System
- Electro Spraying Machine
- 3D Composite Printer









Sabanci SU IMC SABANCI UNIVERSITY Universitesi SU IMC SABANCI UNIVERSITY INTEGRATED MANUFACTURING TECHNOLOGIES RESEARCH AND APPLICATION CENTER Capabilities:

Thermoplastic Polymer Processing:

- Functional compound formulations
- Product design, material selection and prototypes production
- Nanomaterials and inorganic fillers
- Weight reduction and high performance
- Structural, thermal and mechanical properties



Sabanci University Universitesi SU IMC SABANCI UNIVERSITY INTEGRATED MANUFACTURING TECHNOLOGIES RESEARCH AND APPLICATION CENTER Capabilities: Material Characterization:

- Cure cycle determination
- Thermal characterization (TGA, DSC)
- Thermo-mechanical characterization
- Thermal stability and degradation behavior
- Thermal transition under controlled, variable heating and cooling rates
- Rheological behavior under variable shear or temperature
- Thermal conductivity
- Molecular weight analysis
- Heat deflection temperature





Capabilities:

Mechanical Test & Structural Health Monitoring:

- Mechanical properties characterization
- Fatigue and Damage Tolerance characterization
- Dynamic, static and torsional tests
- Thermo-mechanical and structural testing application
- Tests at temperatures between -150 ° C and +500 ° C.
- Weight drop or acceleration tests, impact tests
- Heat, humidity and UV aging,
- Moisture retention at temperatures between -72° Cand +180° C.
- Humidity levels between 10% and 98%





Mechanical Test & Structural Health Monitoring (NDI):

- Crack initiation detection (Acoustic Emission System)
- Crack propagation (Thermography)
- Strain data mapping (DIC)
- Real-time health monitoring (FBG) (>)



A-Scan











Sabanci ... Sabanci UNIVERSITY Universitesi SU IMC SABANCI UNIVERSITY INTEGRATED MANUFACTURING TECHNOLOGIES RESEARCH AND APPLICATION CENTER Capabilities:

Wet Chemistry:

- New resin or epoxy formulation
- Monomers, nanomaterials and polymer synthesis
- Surface functionalization for better interfacial interactions
- Multi-functionality to fabrics, metals and ceramics surfaces
- Functional additives, agents, fillers or tailor-made products
- Self-healing fibers and composites
- High performance thermoplastic composites
- Graphene reinforced epoxy composites
 Flammability:
- Cone calorimeter, Multipurpose burner tester
- Smoke density and toxicity, Limit oxygen index







DiMAP - Direct Digital Manufacturing Platform



Competitiveness and Innovation Sector Operational Programme (2014 – 2020) Action 2: Science, Technology and Innovation (STI) Activity 2.1 : Research and Development



DiMAP - Direct Digital Manufacturing Platform

Overall Objective

The objective of the Operation is to transform and uplift Turkey's manufacturing SMEs to international level in the field of direct digital manufacturing

Operation Purpose

The purpose of the Operation is to strengthen competitiveness of SMEs through utilization of direct digital manufacturing technologies.

Target Groups:

- SMEs
- Start-ups
- Companies
- Institutions
- Universities and Research Centres
- R&D and Design Centres working in composite, automotive and aerospace industries.

Total Budget: 9,768,789 Euro

Thank You...

Abdurrahman Türk, *abdurrahman.turk@sabanciuniv.edu* Cem Emre Memiş, *cem.memis@sabanciuniv.edu*

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