

Amirkabir University of Technology
(Tehran Polytechnic)

Human Movement Analysis

Sports & Rehabilitation

AUT - DFG
Joint Matchmaking Webinar

April 2021

Research Group CV

Human Gait: Nonlinear Dynamic Analysis

- Walking
- Running
- Jogging
- Sprinting
- Agility
- Change of Direction

Sports

- Taekwondo
- Football
- Horse Riding
- Swimming
- Basketball
- Boxing

Rehabilitation

- Coordination
- Agility
- Balance
- Strength
- Fatigue

Research Group Interest

Non-linear analysis of human movement
IMU / Camera based sensory Motion Analysis
Athletic performance enhancement
Rehabilitaion
Therapeutic riding (Hippotherapy)
Mathematical Modelling of Kinesiological deficiencies
Mathematical modelling of Proprioception

Group Research/Industrial Projects

National Iranian Olympic Academy: Study of Taekwondo techniques

National Iranian Olympic Academy: Study of Weightlifting techniques

National Iranian Olympic Academy: Intelligent Sports Specific Conditioning

National Iranian Olympic Academy: Sports Biomechanics and Sports Engineering in Coaching

National Iranian Olympic Academy: Study of Rowing and canowing

National Iranian Olympic Academy: Study of Boxing

MS Society: Multimedia Tai Chi Ball applications for MS patients

National Iranian Armed Forces: Study of Marching

National Iranian Armed Forces: Evaluation of military university entrance physical activity regimen

CPTRH + AUT: Proprioception in Hippotherapy (United Kingdom)

McMan Co. Ltd. UK: Design of Mental Fitness mobile application

McMan Co. Ltd. UK: Design of Sports Specific strength and running programmes

Group Supervised Labs

AUT

Biodynamics Laboratory

Virtual Reality Laboratory

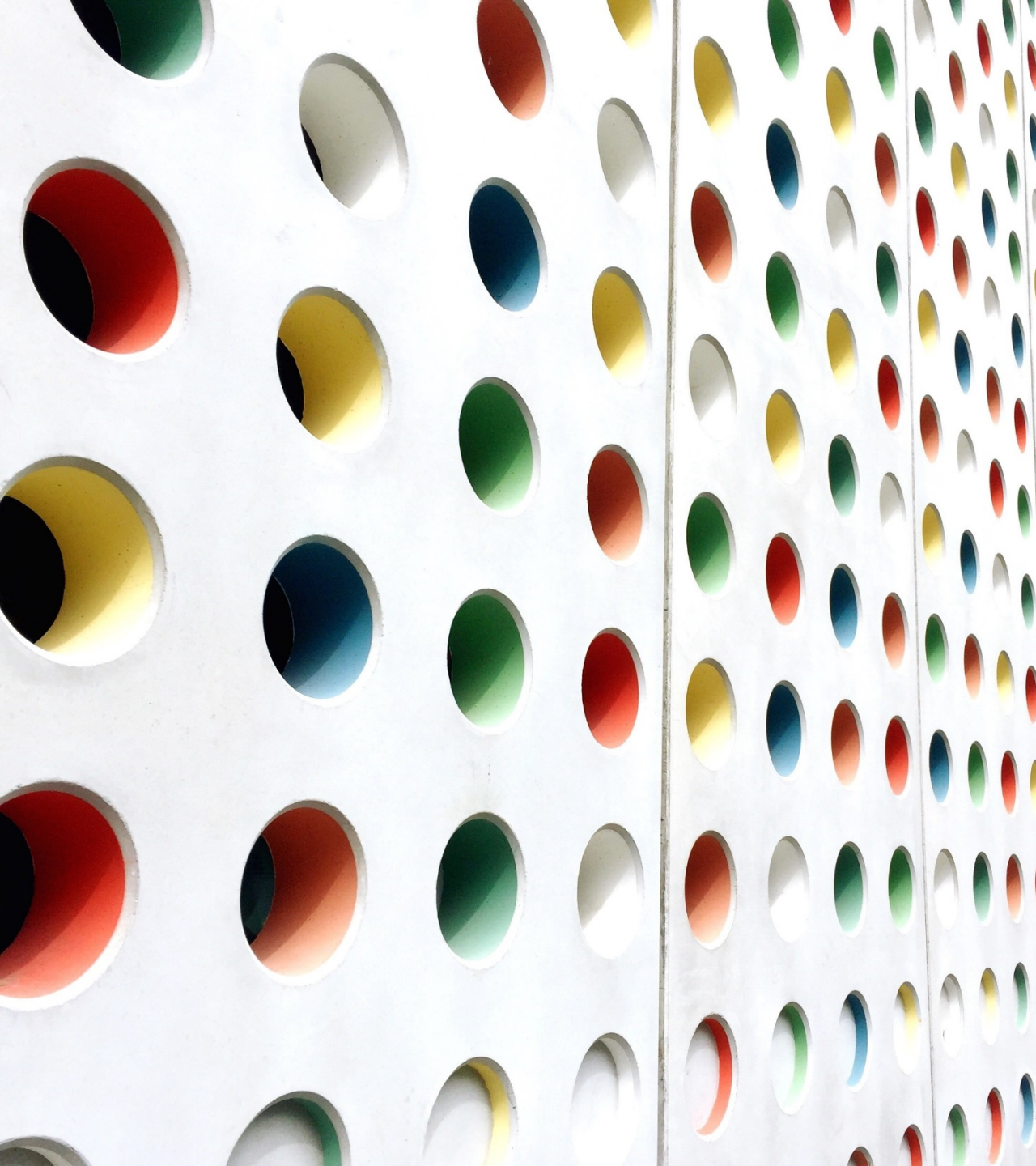
NIOA

Sports Biomechanics Laboratory

Sports Engineering Laboratory

Group Contact Information

Dr Ahmad R. Arshi PhD (Lon) Ceng MIMechE
Email: Arshi@aut.ac.ir; a.r.arshi@gmail.com
Mobile: +98 912 299 1449



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Research Group Members -IRAN

Principal Investigators:



Masoud Latifi
Professor
Head of Advanced Materials & Processes
Engineering Research Center,
Textile Engineering Department,
AMIRKABIR UNIVERSITY OF TECHNOLOGY (Tehran
Polytechnic)

Research Interests: Functional Fibrous Materials

Email: latifi@aut.ac.ir



Roohollah Bagherzadeh,
Assist. Professor at AMIRKABIR UNIVERSITY OF TECHNOLOGY
(Tehran Polytechnic)
Director of Institute for Advanced Textile Materials and
Technologies (ATMT)

Adjunct Professors at Donghua University, China

Research Interests: Advanced Fibrous Materials

Email: bagherzadeh_r@aut.ac.ir

Website www.ffm.aut.ac.ir

Collaborators:



Mohammad-Amin Rahiminia
PhD, Research Associate
Institute for Advanced Textile Materials and
Technologies (ATMT)
AMIRKABIR UNIVERSITY OF TECHNOLOGY
(Tehran Polytechnic)

Email: ma.rahiminia@aut.ac.ir



Emad Imeni-Pour

Ph.D. Student in Biomedical Engineering

Email: e.imenipour@maadintl.com

Potential partners in Germany



Dr Mohammad E. Barbati

Consultant Vascular and Endovascular Surgeon

University Hospital of Aachen, DE

Head of the European Venous Centre Aachen-Maastricht, Department of Vascular & Endovascular Surgery

Email: mbarbati@ukaachen.de



Project Advisor in Germany:

Prof. Dr. Khosrow Mottaghy

*Dept. of Physiology
RWTH Aachen University*

Email: kmottaghy@ukaachen.de

Research Group CV

Industrial Partners:

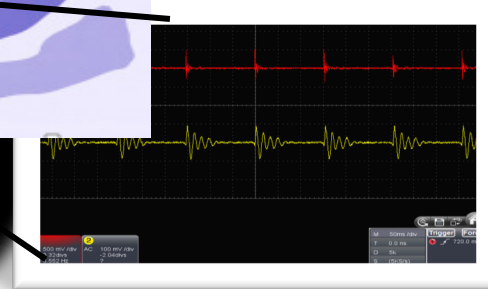
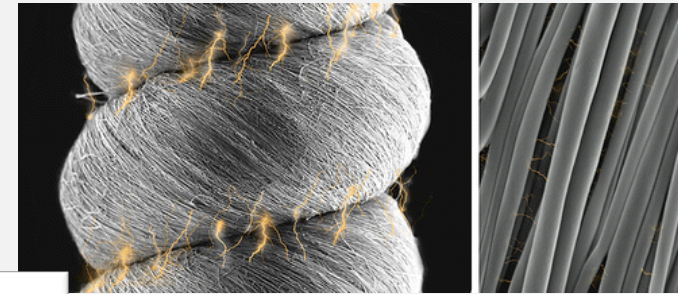
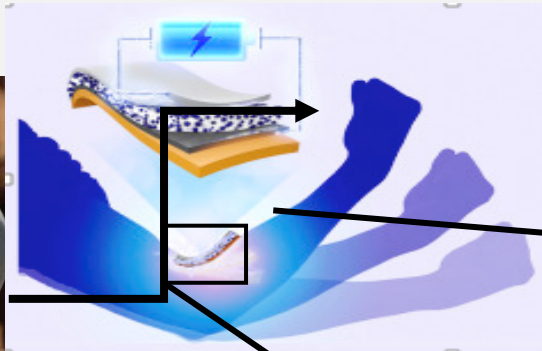
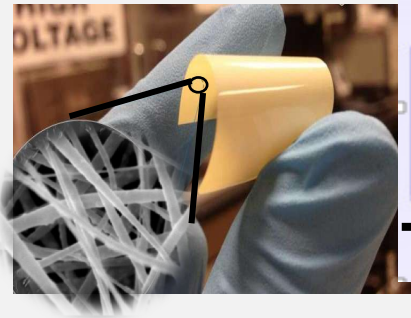
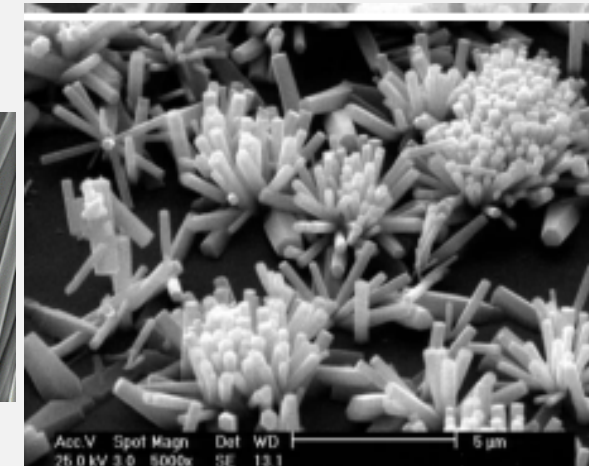
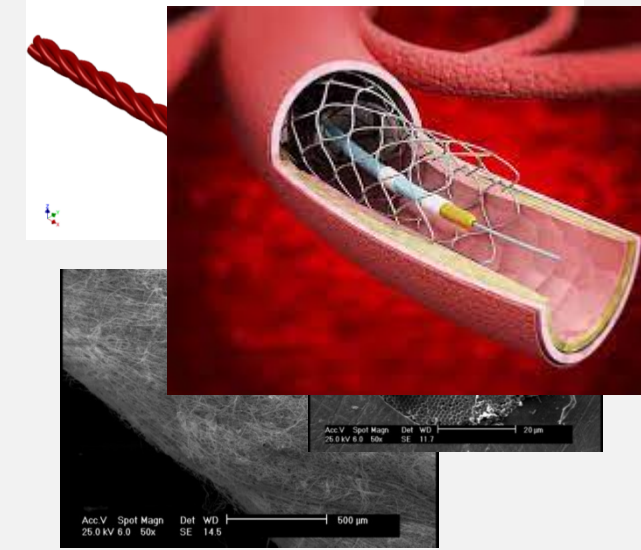
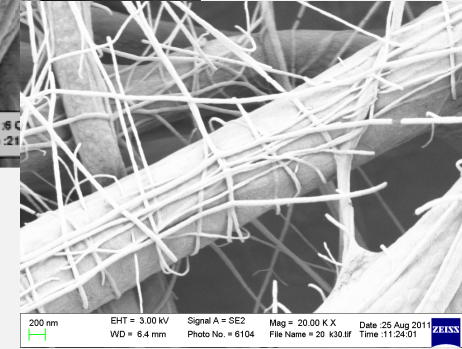
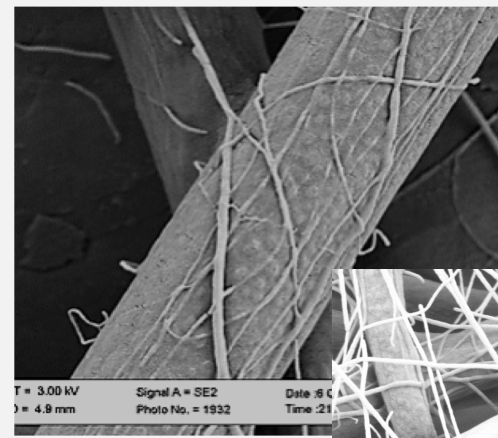
- ❖ Jeanweast
- ❖ Iranian Textile and Apparel Association
- ❖ Iran Nanotechnology Innovation Council

International Collaborations:

- Collage of Textile, Donghua University, China.
- Department of Textile and Clothing Science, University of Novi Sad, Serbia.
- Institute for Frontier Materials, Deakin University, Australia.
- Modart International, Paris, France
- University of Lille, France
- University of Johannesburg, South Africa.
- Cologne University, Germany
- University of Pisa, Italy

Research Group Interest

- ❖ Biomedical Textile Based Materials
- ❖ Fibrous structure
- ❖ Flexible and stretchable sensors
- ❖ Advanced and Functional Fibrous Materials
- ❖ Wearable and Flexible Piezo&Triboelectric Nanogenerator
- ❖ High-Performance textile and clothing
- ❖ Smart & Functional Textile and Clothing



Group Research/Industrial Projects

Chief Investigator:

- NanoCellulose, 2020
- “Energy Harvesting Fabrics”, 2018.
- “Fabrication of Extreme Hot Weather Clothing System”, 2017.
- “Technical specifications and feasibility study for production of extreme cold weather clothing system”, 2015.
- “Nano-micro-fibrous composite structures for smart detection of toxic chemical agents”, 2014.
- “Developing comfort Indices of high performance fabrics and textile based equipment”, 2010.

Principal Investigator:

- “Developing a comprehensive strategic plan for the national apparel industry”, 2015.
- “Fabrication of nanostructured yarns for production of textiles based energy convertor”, 2014.
- “Fabrication of Nanofibrous Composite Structures Generating Energy in Wearable Microelectronic Devices”, 2014.
- “Cooling garment production by using profiled cross section fibers”, 2014.
- “Natural Micro-Nanofibrous Composite Scaffolds for Neural Tissue Regeneration Application”, 2013.
- “Developing a national brand for Small business plastic companies”, 2013.
- “Improving Concrete Strength and Cracking level of Lightweight Concrete by Utilizing Fibers”, 2010.

Associate Investigator:

- “Optimization and combination of materials needed to fire retardant of acrylic – polyester fabric”, 2014.
- “Know-how of production of antibacterial Polyamide Knitted fabrics”, 2011.
- “know-how of embedding durable fragrances in worsted fabrics”, 2010.
- “Developing a tint for temporary coloring the dark fibers in worsted spinning”, 2010.

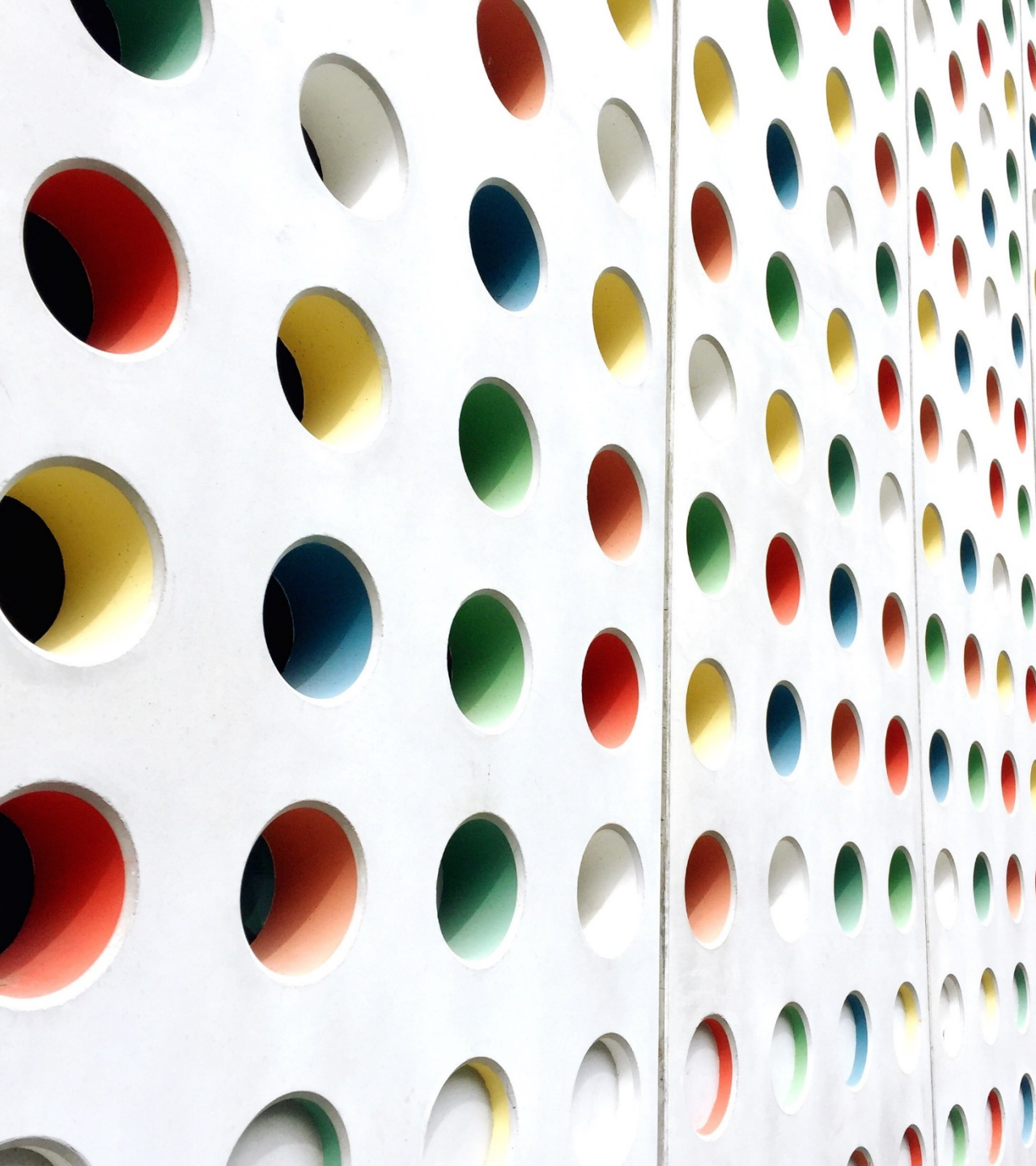
Group Supervised Labs

•High Performance Fibrous Structure LAB:

- **Piezoelectric & sensor Evaluation Instrument (Piezotester):** A piezoelectric sensor is a device that uses the piezoelectric effect, to measure changes in pressure, acceleration, temperature, strain, or force by converting them to an electrical charge).
- **Spin coating:** (Spin coating is a procedure used to deposit uniform [thin films](#) onto flat [substrates](#). Usually a small amount of coating material is applied on the center of the substrate, which is either spinning at low speed or not spinning at all. The substrate is then rotated at high speed in order to spread the coating material by [centrifugal force](#).)
- **Electrospinning set-up**
- **3D Printing Machine:** The term **3D printing** covers a variety of processes in which material is joined or solidified under [computer control](#) to create a [three-dimensional](#) object, with material being added together (such as liquid molecules or powder grains being fused together), typically layer by layer.

•Pilot-plant scale Melt-Spinning set up

•Electronic Textiles



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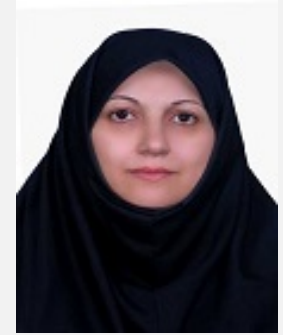
AUT - DFG

Joint Matchmaking Webinar

April 2021

Research Group CV

Dr.-Ing. Azizeh Javadi



Education & Affiliation:

Ph.D. of Polymer Engineering
Assistant professor

Faculty member at the Department of Polymer and Colour Engineering, Amirkabir University of Technology (AUT)

Courses:

Physical and mechanical properties of polymers lab. 1994 to 2009

Statics and Strength of materials 2010 up to now

Research methodology 2015 up to now

Polymer foams 2017 up to now

Books:

An overview of the main physical and mechanical test methods for polymers

Statics

Physical and mechanical properties of polymers test method standards

Papers:

More than 60 ISI journal and international conference papers

Research Group CV



Professor Dr.-Ing. Volker Altstädt

Since October 1, 2000, Professor Dr.-Ing. Volker Altstädt has headed the chair for "Polymer Engineering" at the "Faculty of Applied Natural Sciences" / "Faculty of Engineering Science" at the University of Bayreuth. Since September 30, 2020, he has been relieved of his duties as a university lecturer but is still linked to the University of Bayreuth via a service contract. He is an elected member of the German Academy of Engineering Sciences (acatech) and Executive Officer of the Polymer Processing Society (PPS).

After studying physics and obtaining his doctorate in 1987 at the "Institute for Materials Engineering" with Professor Ehrenstein in Kassel, he worked for 8 years in the "Polymer Research Division" of BASF SA in Ludwigshafen. In October 1995, Volker Altstädt was offered full professorship at the Technical University of Hamburg-Harburg, where he headed the "Plastics and Composite Materials Department" until he accepted the chair at the University of Bayreuth. Since July 2009 he has also been the managing director of "Neue Materialien Bayreuth LtD".

Research Group CV



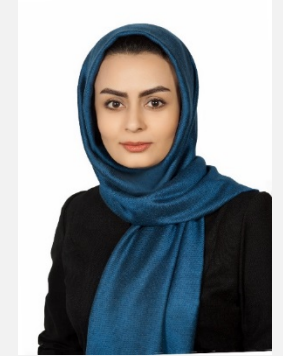
Professor Dr.-Ing. Holger Ruckdäschel

Head of Department of Polymer Engineering at the University of Bayreuth since January 1, 2021.

After studying materials science, he received his doctorate in 2009 at the chair of polymer materials under Prof. Altstädt in Bayreuth. After 13 years of industrial experience at BASF, he returned to his academic roots. At BASF, he worked in a wide range of topics and most recently headed the digital strategy of the plastics division. His other positions include polymer research and leading global roles in wind energy research and plastic additives. In recent years, he and his team have also driven digital innovations and new business models for the plastics industry.

Research Group CV

Mahboobeh Shahnooshi



Education & Affiliation:

Double degree Ph.D. student of Polymer Engineering between Amirkabir University of Technology (AUT) and University of Bayreuth. Scientific staff member, Department of Polymer Engineering, University of Bayreuth.
Batchelor of Chemical Engineering (2004-2008), AUT
Master of Polymer Engineering (2009-2012), AUT

Books:

Comprehensive Technical Guidelines for Polyethylene Pipes and Fitting (National ID 5096956), 2018.

Papers:

Rheological Rationalization of In Situ Nanofibrillar Structure Development; Tailoring of Nanohybrid Shish-Kebab Superstructures of Poly (lactic acid) Crystalline Phase, Polymer (2020).
Development of in situ nanofibrillar poly (lactic acid)/poly (butylene terephthalate) composites: Non-isothermal crystallization and crystal morphology, European Polymer Journal (2020).

Research Group Interests

- Processing and compounding of sustainable polymers and petroleum-based polymers
- Polymer foam processing, modification, and characterization
- Physical chemistry of polymer blends and solutions
- Rheological studies of morphology development, phase separation, and structural investigation of multi-phase polymer blends
- X-ray analysis of nanohybrid structures
- Thermal analysis of polymer blends and nanocomposites
- Additive manufacturing
- Fracture mechanics of polymer blends and nanocomposites
- Structure-properties relationship of polymers and tailoring their applications

Group Research/Industrial Projects




- Impact modification of polystyrene by blending with thermoplastic polyurethane
- Preparation of high pressure PE tubes for gas transmission
- Dynamic Creep and Fatigue Properties of Novel Elastomeric Biomaterials
- Evaluation of the structure-property-relationships of novel halloysite-polymer nanocomposites
- Production of temperature-resistant, recycled PET/PBT particle foams and clarification of the structure-property relationships in foaming and welding
- Formation and degradation of microplastics under simulated environmental influences
- Morphology control of semi-crystalline polymers through supramolecular additives
- Fundamental investigation of stress crack effects in plastic nanocomposites

Group Supervised Labs




- Physical and mechanical properties of polymers lab
- Rheology of polymers lab
- Thermal analysis lab
- Impact, creep and fatigue
- Polymer processing lab
- Injection molding
- Micro processing
- Additive manufacturing
- RTM and Prepreg processing
- Batch, extrusion and bead foam processing

Group Contact Information




Dr.-Ing. Azizeh Javadi

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Prof. Dr.-Ing. Volker Altstädt

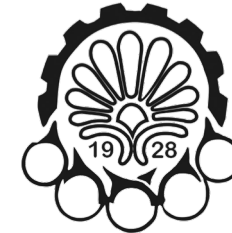
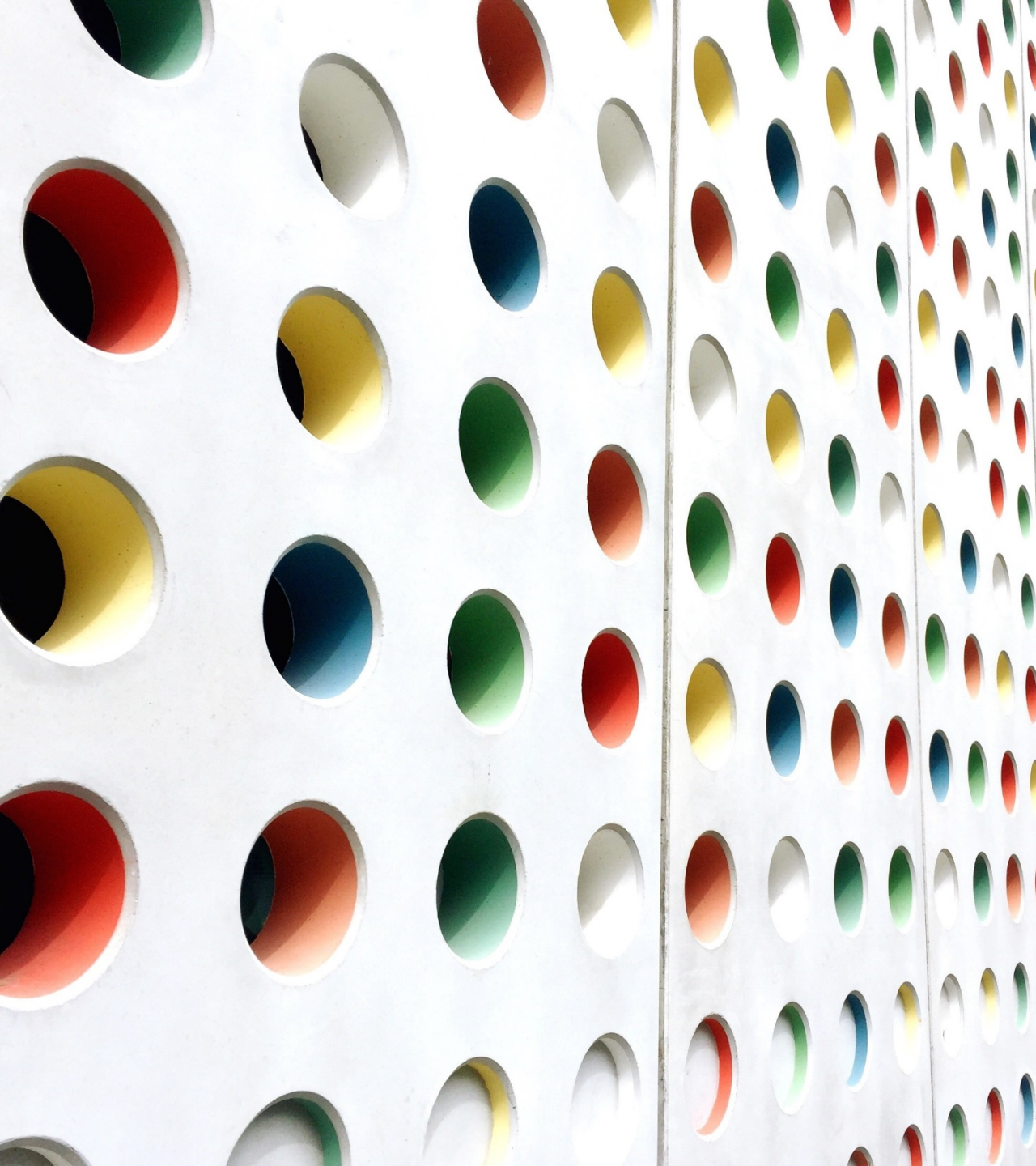
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**Amirkabir University of Technology
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AUT - DFG

Joint Matchmaking Webinar

April 2021

Research Group CV

Title:

Manufacturing of Nanocomposites by Using Friction-Stir-Based Methods

Members:

- **Dr. Seyyed Ehsan Mirsalehi, Associate Professor (Head)**
Amirkabir University of Technology (Department of Materials and Metallurgical Engineering)
- _ **Hamed Vaez, Ph.D. Student**
Amirkabir University of Technology (Department of Materials and Metallurgical Engineering)
- _ **Emad Cheraghirizi, Ph.D. Student**
Amirkabir University of Technology (Department of Materials and Metallurgical Engineering)
- _ **Amir Jamali, M.Sc. Graduate**
Amirkabir University of Technology (Department of Materials and Metallurgical Engineering)
- _ **Amir Hossein Sahraei, M.Sc. Student**
Amirkabir University of Technology (Department of Materials and Metallurgical Engineering)
- _ **Soheil Kiani, M.Sc. Student**
Amirkabir University of Technology (Department of Materials and Metallurgical Engineering)
- _ **Ahmad Papi, M.Sc. Student**
Amirkabir University of Technology (Department of Materials and Metallurgical Engineering)
- _ **Ali Sheykhholeslami, M.Sc. Student**
Amirkabir University of Technology (Department of Materials and Metallurgical Engineering)

Research Group Interest

- Nanocomposite Manufacturing
- Friction Stir Deposition
- Friction Stir Processing
- Friction Stir Cladding

Group Research/Industrial Projects

- Effect of Tool Rotation Speed in Friction Stir Deposition of Aluminum-Matrix Nanocomposites
- Investigation on Effect of Tool Traverse Speed in Friction Stir Deposition of Aluminum-Matrix Nanocomposites
- Influence of Pass Number in Production of AA7075-ZrO₂ Nanocomposites by Friction Stir Processing
- Investigation on Effect of Reinforcement Gradient on Microstructure in Aa2024-Al₂O₃ Nanocomposites Produced by Friction Stir Deposition
- Investigating the Effect of Tool Rotation Speed in Surfacing on Aluminum Using Friction Stir Method
- Fabrication of Al-ZrO₂ Nanocomposites by Friction Stir Processing

Group Supervised Labs

- Advanced Joining Laboratory

Department of Materials and Metallurgical Engineering
Amirkabir University of Technology, Tehran, Iran

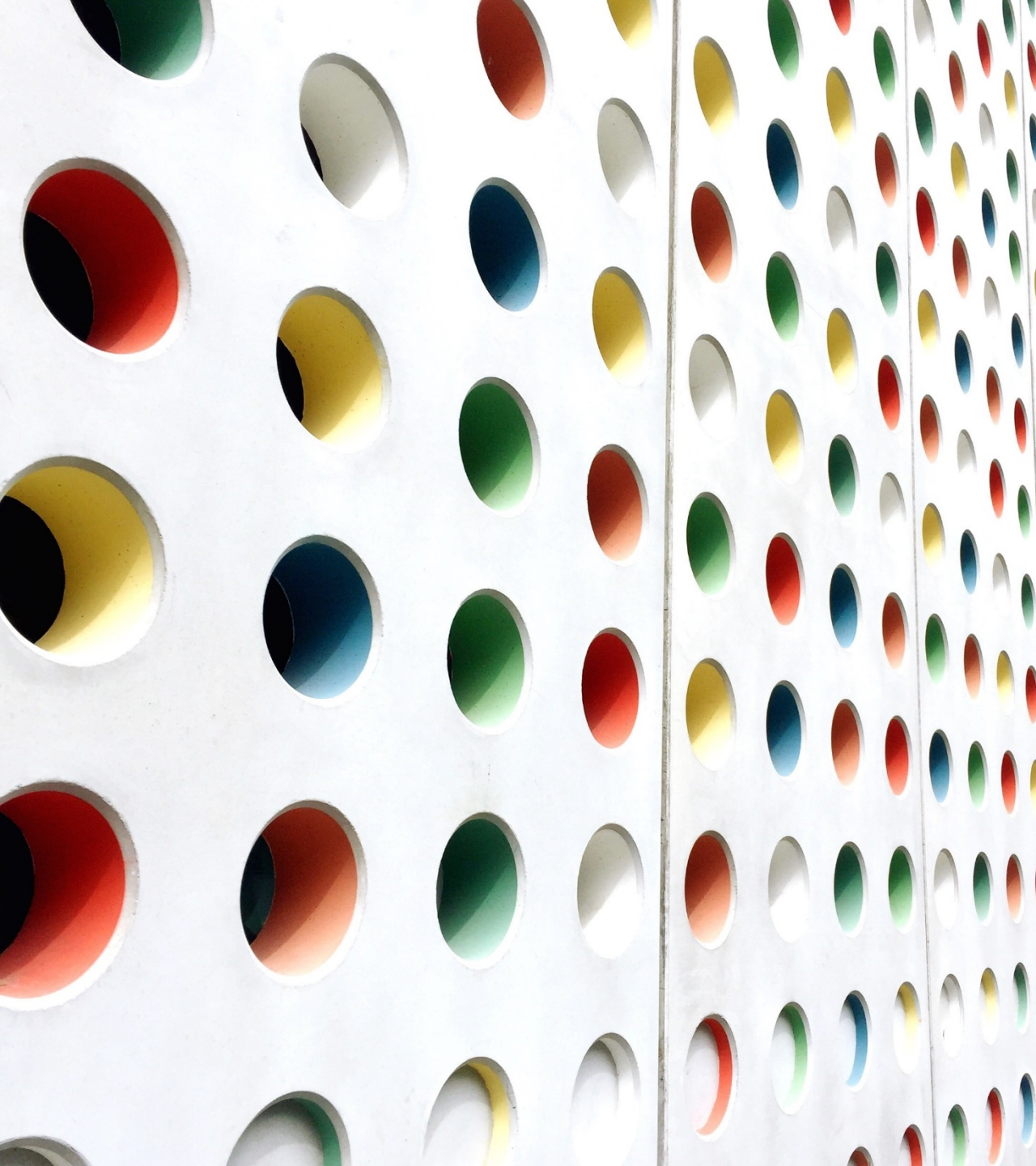
Group Contact Information

Dr. Seyyed Ehsan Mirsalehi, Associate Professor

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Research Group CV

Jairan Nafar Dastgerdi (<https://www.researchgate.net/profile/Jairan-Dastgerdi>)

10/2019-up to now. Assistant Professor (Tenure Track), Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran.

Degrees

12/2012-09/2016. Ph.D. Degree in Mechanics of Material, Aalto University, Finland.

8/2010-3/2013. Ph.D. Degree in Mechanical Engineering, Isfahan University of Technology, Iran.

Previous work experience

08/2020-12/2020. Visiting Professor, Aalto University, Espoo, Finland.

10/2016-09/2019. Post-doctoral researcher in the Mechanical Engineering Department at Aalto University, Finland.

01/2013-09/2016. Doctoral candidate in the Department of Mechanical Engineering at Aalto University, Finland.

03-09/2015. Visiting researcher in the Department of Mechanical Engineering at the National University of Singapore (NUS), Singapore.

06-12/2012. Postgraduate researcher in the Department of Mechanical Engineering at Aalto University.

09/2010- 05/2012. Postgraduate researcher in the Department of Mechanical Engineering at the Isfahan University of Technology, Isfahan, Iran.

01-05/2011. Industrial project researcher in Esfahan Steel Company (ESCo), Isfahan, Iran. Research project: Thermo-mechanical stress analysis of steelmaker mixer with new refractory conditions implemented by the VESUVIUS Company.

Awards and honors

2020. Financial Awarded from the **National Elite Foundation** of Iran for young assistant professors to establish their research group, Presidency of Islamic republic of Iran, Iran.

2019. Awarded for appointing as an assistance professor (Tenure Track) in Amirkabir University of Technology using **Dr. Shahriari Award** by **National Elites Foundation**, Presidency of Islamic republic of Iran.

2017. Financial Awarded from the **National Elite Foundation** of Iran for the excellence of studies, Iran.

2016. Scholarship award from Aalto University for a doctoral degree completion less than eight full semesters, Finland.

2015. Scholarship award from the Ministry of Education of Finland for a 6-month visiting internship at NUS (Singapore), Finland.

2013. Scholarship award for doctoral studies (3years) by the Ministry of Education of Finland through the National Graduate Program of Engineering Mechanics, Finland.

2010. First ranked student in M.Sc. with the highest GPA in the School of Engineering at Kashan University, Iran.

2008. Ranked in the top 10 percent of students as an **Exceptional talent** among graduated students at Kashan University. Admitted to the Master's program of Mechanical Engineering by the Council of Exceptional Talent without any academic entrance exam, Iran.

Research supervision and leadership experience

11/2019 up to now. Supervisor of 2 postgraduate students at AUT (Tehran Polytechnic), Tehran, Iran.

12/2020 up to now. Supervisor of 3 undergraduate students at AUT (Tehran Polytechnic), Tehran, Iran.

04/2018- 07/2020. Advisor of a master thesis at AUT (Tehran Polytechnic), Tehran, Iran.

04/2019- 12/2019. Advisor of a master thesis at Aalto University, Finland.



Research Group CV

Dr.-Ing. Jonas Hensel

Post-doc, Group Leader “Welding and Beam Technology”
*18.05.1983 in Bremen, Germany

<https://www.researchgate.net/profile/Jonas-Hensel>



Univ.-Prof. Dr.-Ing. Klaus Dilger

Technische Universität Braunschweig
Institute of Joining and Welding
Langer Kamp 8, Germany

<https://www.tu-braunschweig.de/ifs>

Academic education

2017 Dr.-Ing. (summa cum laude), Faculty of Mechanical Engineering, Technische Universität Braunschweig
2008 – 2009 M.Sc. Ocean Engineering (Dual Degree Program), University of Rhode Island, USA
2004 – 2009 Dipl. Ing. Civil Engineering, Technische Universität Braunschweig

Postgraduate professional career

2017 – current Post-doc, Group Leader “Welding and Beam Technology”, Institute of Joining and Welding, Technische Universität Braunschweig
Main research Areas: Welding processes, additive manufacturing, fatigue of welded components
7 supervised Phd researchers, 12 undergraduate students
2011 – 2017 Phd researcher, Institute of Joining and Welding, Technische Universität Braunschweig
2010 – 2011 Phd researcher, Institut of Steel Structures, Technische Universität Braunschweig
2009 – 2010 Structural Engineer, Hochtief Construction AG, Civil Engineering and Marine Works, Hamburg

Other

International Welding Engineer
Henri Granjon Prize 2019, Category C: Design and Structural Integrity, International Institute of Welding (IIW)
Expert of Commission XIII “Fatigue Behaviour of Welded Components and Structures”, International Institute of Welding (IIW)
Expert of Commission XV “Design, Analysis and Fabrication of Welded Structures”, International Institute of Welding (IIW)

Research Group Interest

Additive Manufacturing:

Wire Arc Additive Manufacturing (WAAM), High strength metals

Residual welding stresses

Surface roughness

Fatigue performance and its prediction

Damage evolution using *in-situ* X-ray micro tomography and digital volume correlation

Numerical analysis (Finite element simulation):

Interaction of residual stress and surface roughness effect on the fatigue performance of WAAM steel parts



Group Research/Industrial Projects

- ❑ Damage mechanism of metal additive manufactured parts
- ❑ Microstructural characterization of particulate-reinforced metal matrix composites via X-ray microcomputed tomography

- ❑ Collaborative research center TRR277 TP A07
“Wire Arc Additive Manufacturing of Complex Individualized Steel Structures”
- ❑ Industry-related research projects on welding process development (AiF / IGF)
- ❑ Industry-related research projects on fatigue of welded components (AiF / IGF)

<https://www.tu-braunschweig.de/en/ifs/research/divisions-and-competences/welding-and-beam-technology/research>

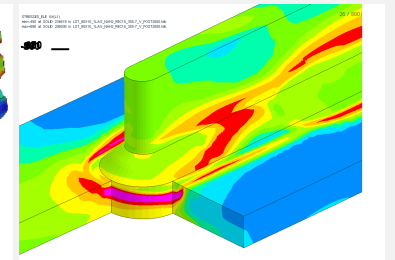
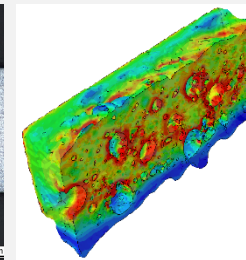
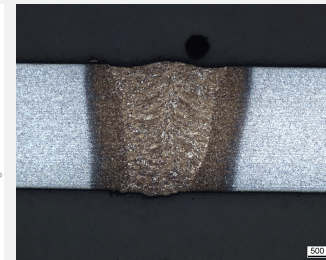
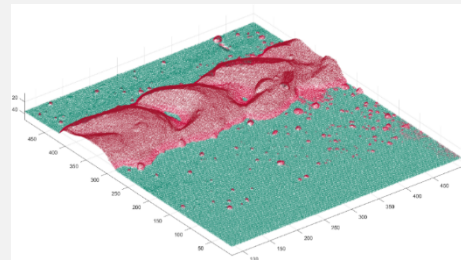
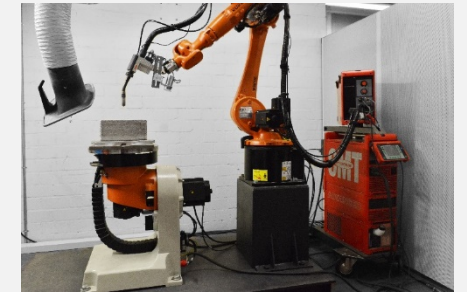
Group Supervised Labs

Jairan Nafar Dastgerdi:

- Supervisor of transmission electron microscopy (TEM) lab Central lab, Amirkabir University of Technology
- Fatigue lab
- Metallography (incl. SEM) lab
- Additive manufacturing lab

Jonas Hensel:

- Arc and resistance welding lab
- Beam welding lab (laser & electron beam welding)
- Non-destructive testing (incl. X-ray CT, XRD) lab
- Destructive testing lab
- Metallography (incl. SEM) lab



Group Contact Information

Jairan Nafar Dastgerdi

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+98-21-64543656 (office)

Jonas Hensel

Email: j.hensel@tu-braunschweig.de

Phone:

+49-531 391 95517

Research Proposal
On

“Flutter and Vibration Control of Smart Sandwich Beam, Using Multi-Objective Optimization Method (NSGA III)”

Prepared

By: **Dr. Mohammad Nezami**
Behnam Gholami

April 2021

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Introduction

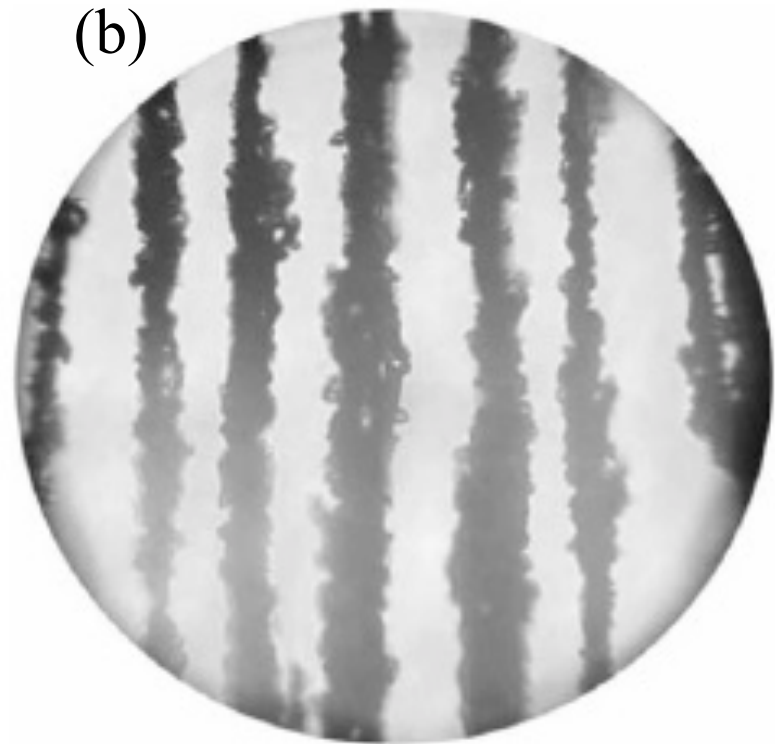
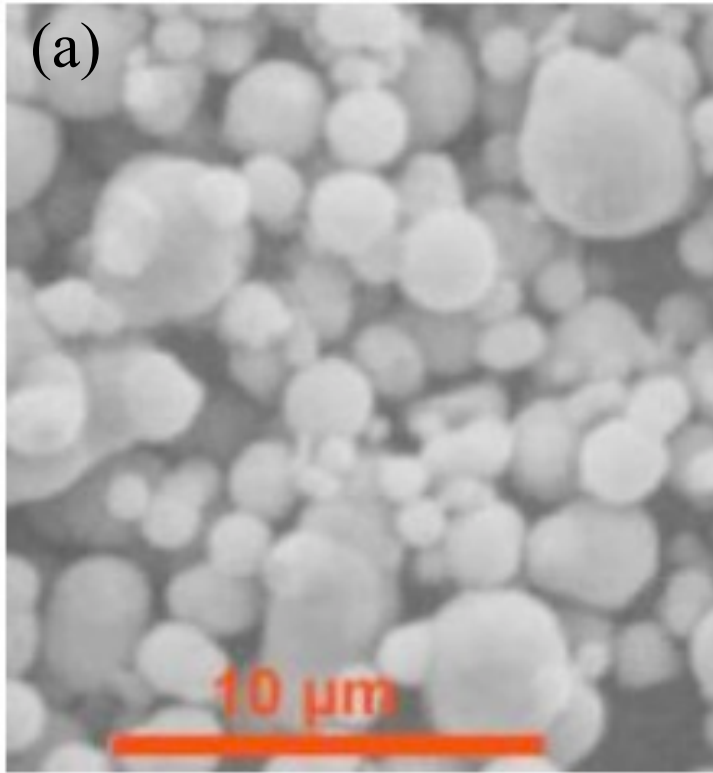


Introduction



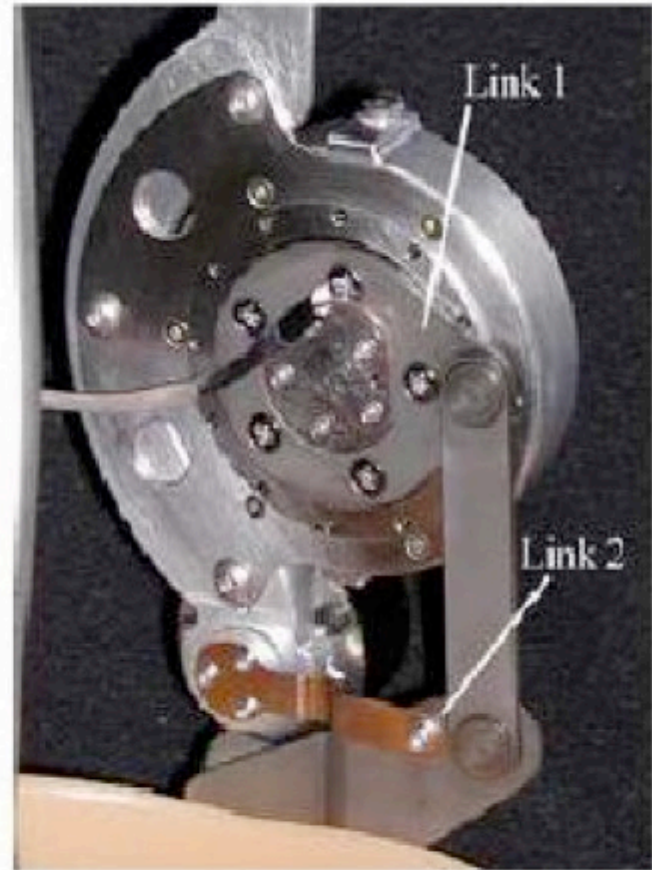
Ref [1]. (a) Magneto rheological fluid from Lord company and (b) ferrofluid

Introduction



Ref [1]. MR fluid with (a) no magnetic field (b) an applied magnetic field.

Introduction



Ref [2]. An ankle-foot orthosis using MR brake

Introduction



Ref [2]. A haptic interface with MR brake for dental implant surgery

Literature Review



Literature Review

Title	Authors	Year
[3]. Effect of axially graded constraining layer on the free vibration properties of three layered sandwich beams with magnetorheological fluid core	A.O. Soroor <i>et al.</i>	2020
[4]. Experimental dynamic analysis of composite sandwich beams with magnetorheological honeycomb core	F. d. S. Eloy <i>et al.</i>	2018
[5]. Finite Element Vibration Analysis of a Magnetorheological Fluid Sandwich Beam	V. Rajamohan <i>et al.</i>	2013
[6]. Vibration analysis of a multi-layer beam containing magnetorheological fluid	V. Rajamohan <i>et al.</i>	2010
[7]. Optimal control of structural vibrations using a mixed-mode magnetorheological fluid mount	S. B. Choi <i>et al.</i>	2008

Literature Review

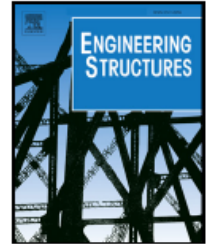
Engineering Structures 176 (2018) 231–242



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Experimental dynamic analysis of composite sandwich beams with magnetorheological honeycomb core



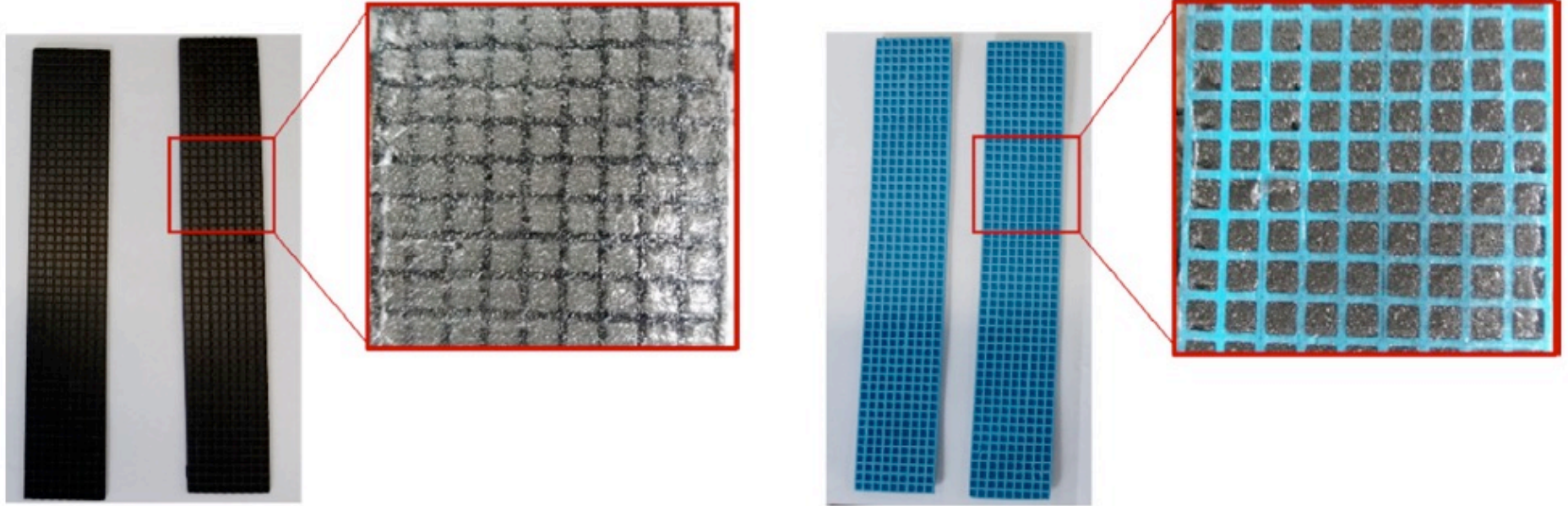
Felipe de Souza Eloy^{a,*}, Guilherme Ferreira Gomes^a, Antonio Carlos Ancelotti Jr.^a,
Sebastião Simões da Cunha Jr.^a, Antonio José Faria Bombard^b, Diego Morais Junqueira^a

^a Mechanical Engineering Institute, Composite Technology Center – NTC, Federal University of Itajuba (UNIFEI), Av. BPS, 1303, 37500-903 Itajuba, Brazil

^b Physics and Chemistry Institute, Federal University of Itajuba (UNIFEI), Av. BPS, 1303, 37500-903 Itajuba, Brazil

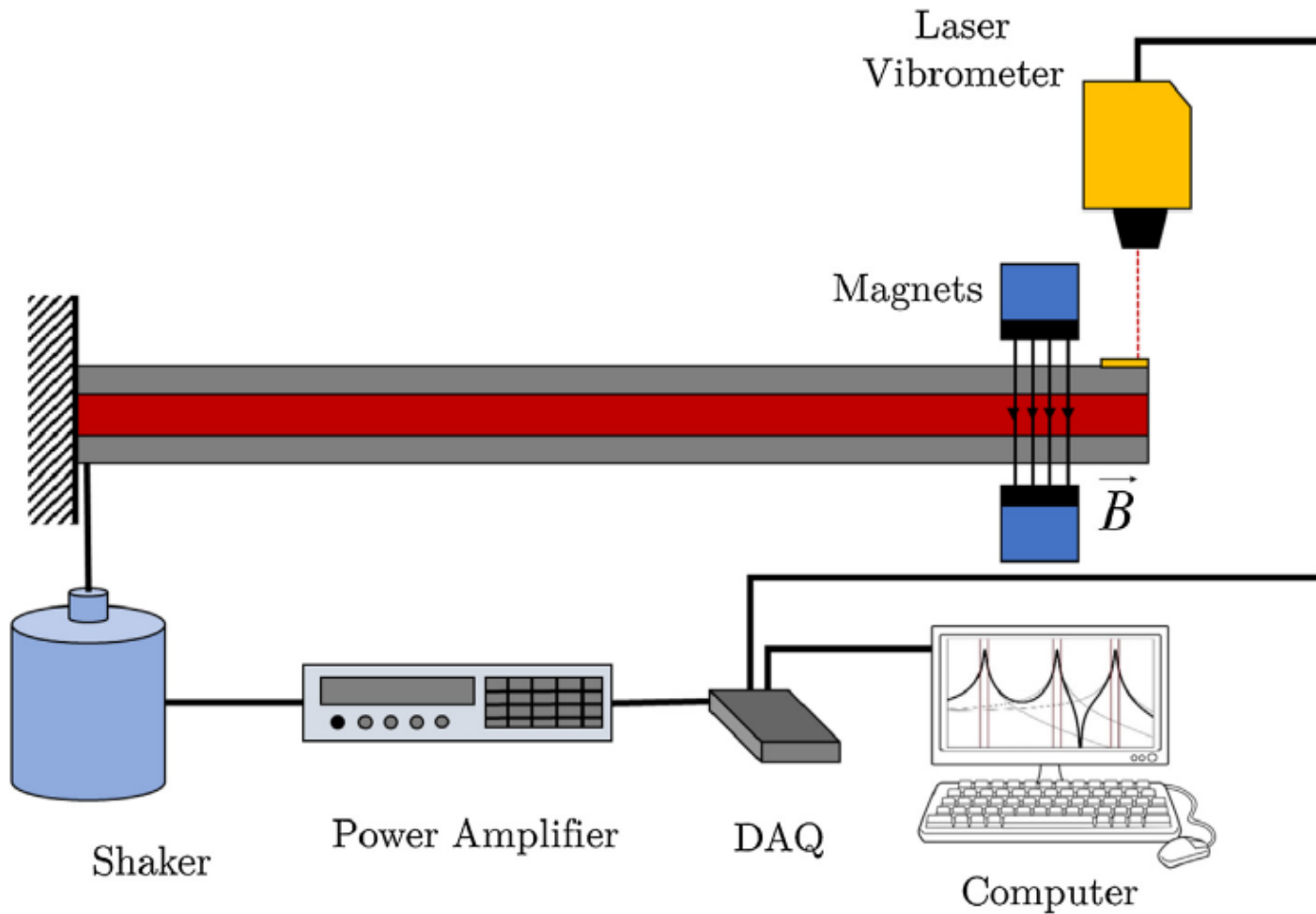
Ref [1]. (a) Puncture resistance testing and (b) deformation in a clay backing material.

Literature Review

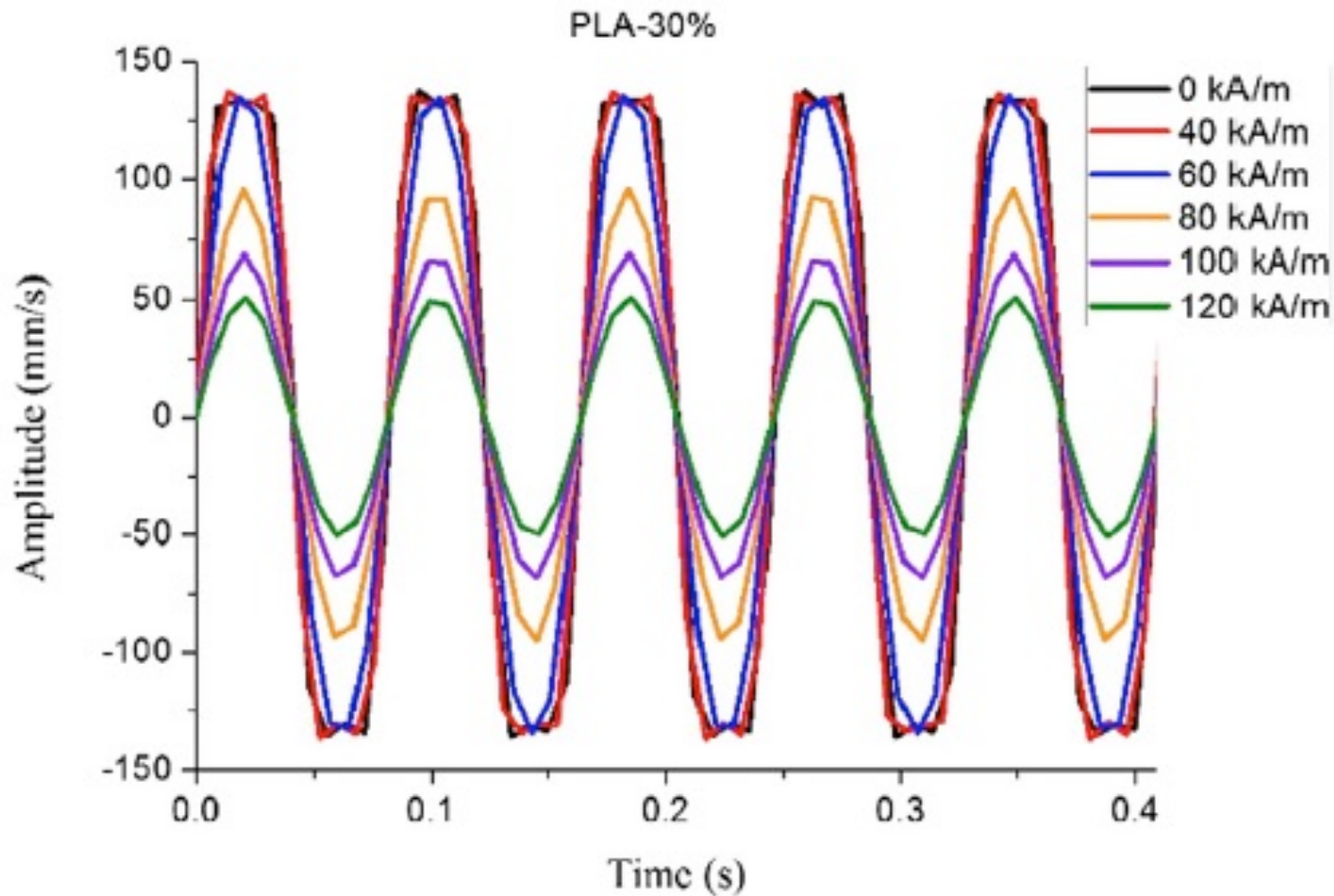


Ref [1]. 3D printed honeycomb core filled with MRE

Literature Review



Literature Review



Ref [1]. Results of forced vibration for the specimens

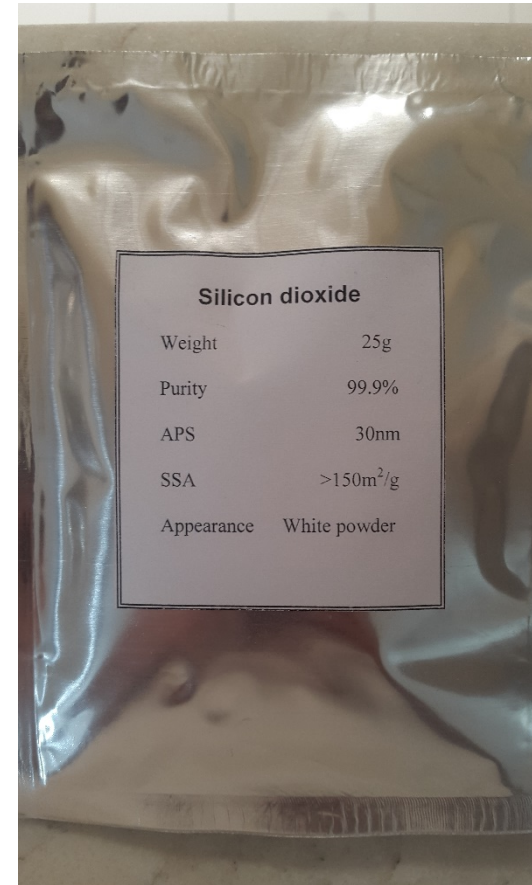
Fabricated Smart Material



Smart Material

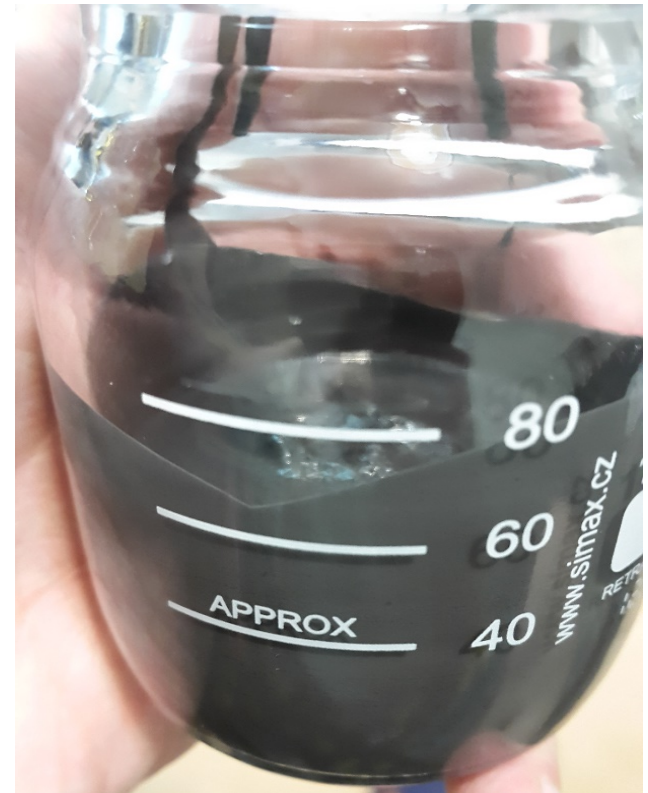


Carbonyl iron manufactured in BASF.



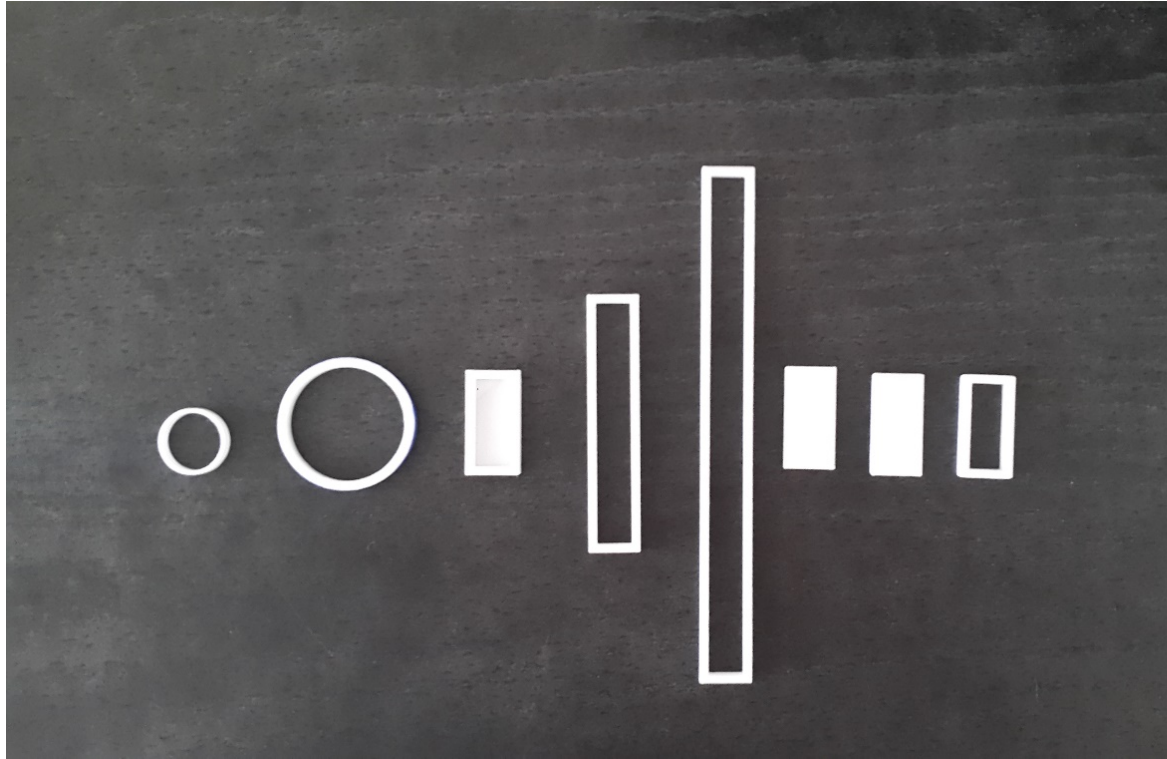
Nano SiO₂ Powder

Smart Material



Manufactured Magneto-rheological Fluid (MRF)

Smart Material



3D Printed Component using FDM.

Smart Material



Smart Material



Smart Material



Smart Material

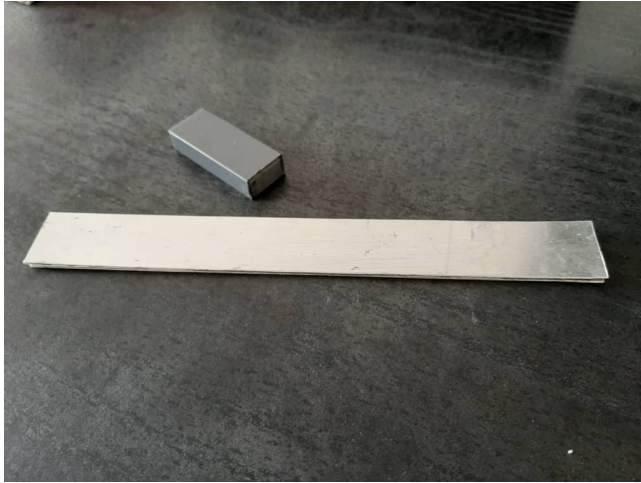


1) Sandwich Beam with 3D Printed Frame Containing MRF (SB-Framed)



2) Fully 3D Printed Core MRF Layer embedded in Sandwich Beam (SB-Full)

Smart Material

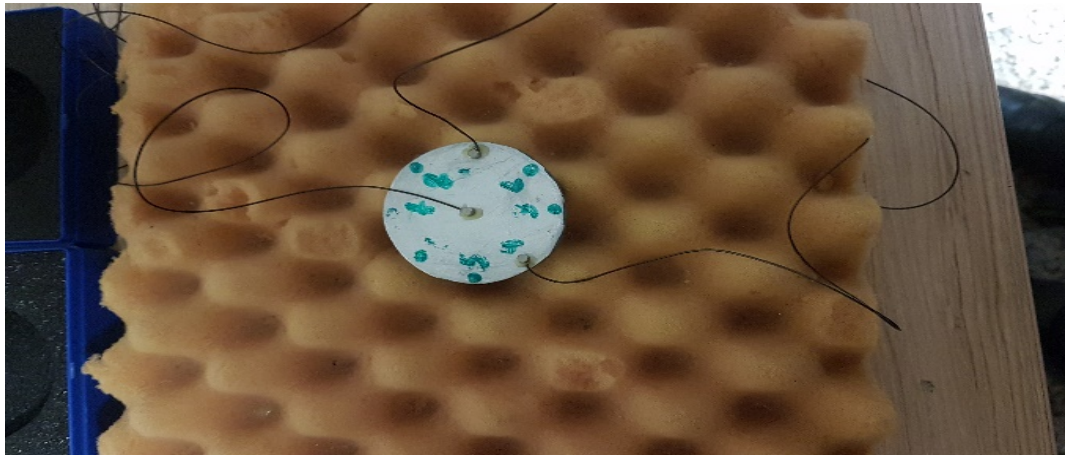


3) Multi-layer Sandwich Beam along with an MRF Pocket 3D Printed (SB-Pocket)

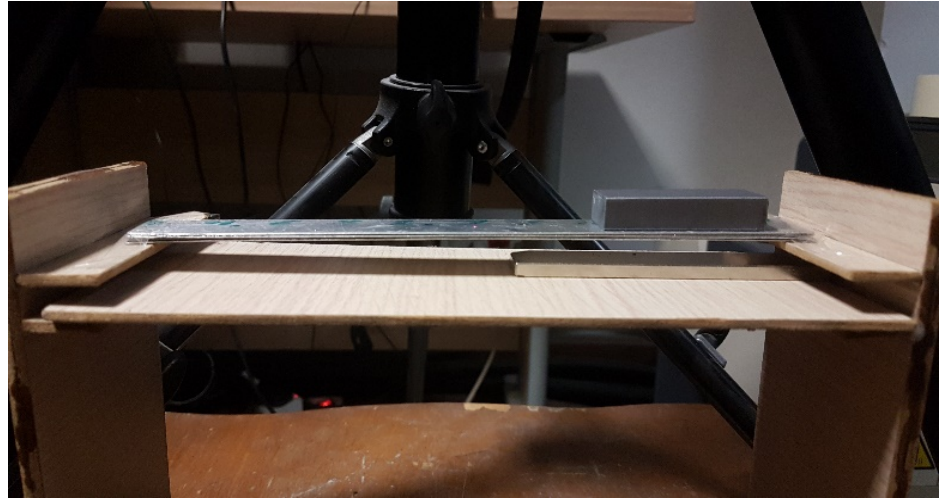


4) Sandwich Disk with MRF Core Layer

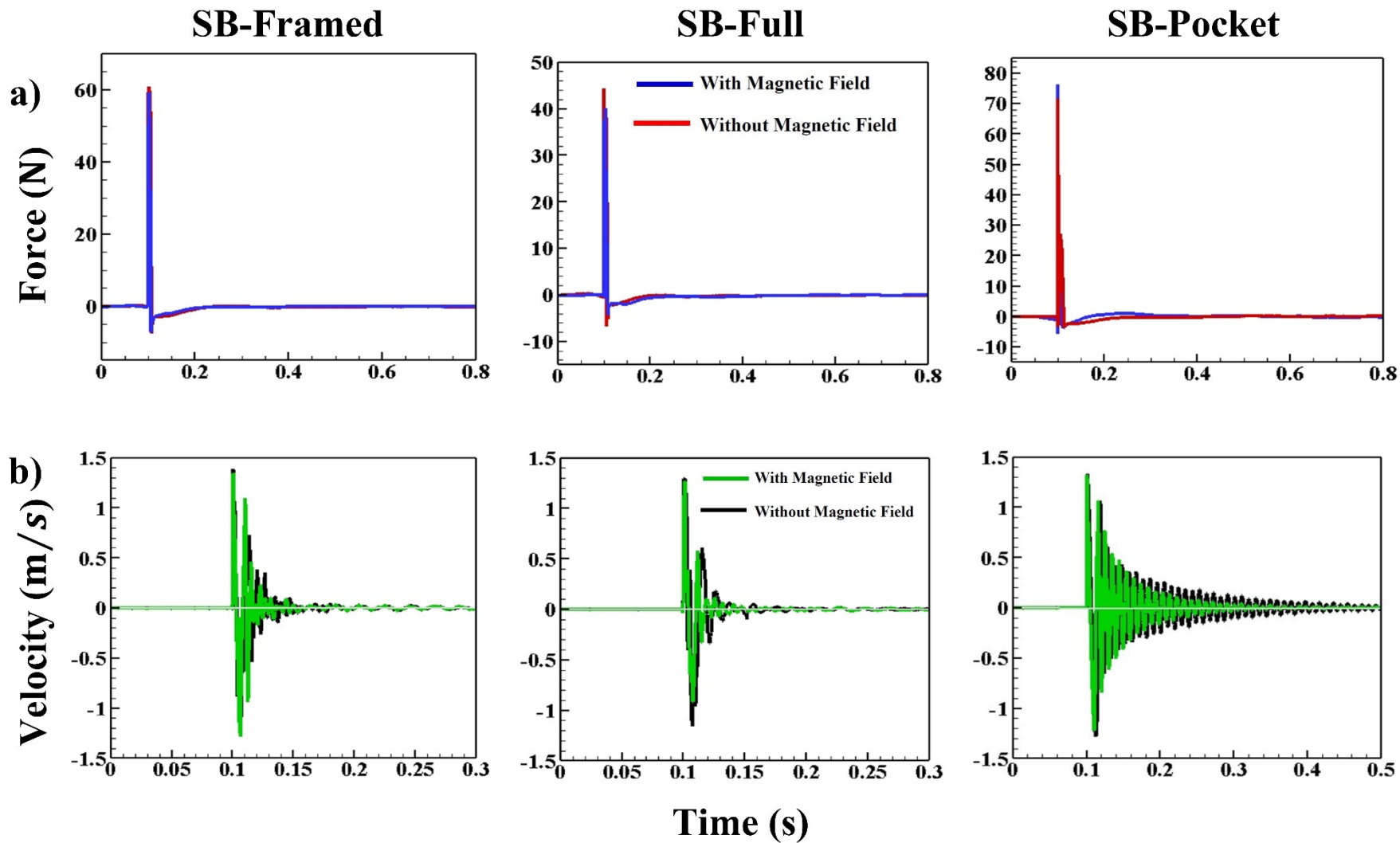
Smart Material



Smart Material



Smart Material



Method and Approach



Method and Approach

Mathematical Model

Optimization

Smart Material Manufacturing

Component Designing

Experimental Testing



6

(months)

4

(months)

6

(months)

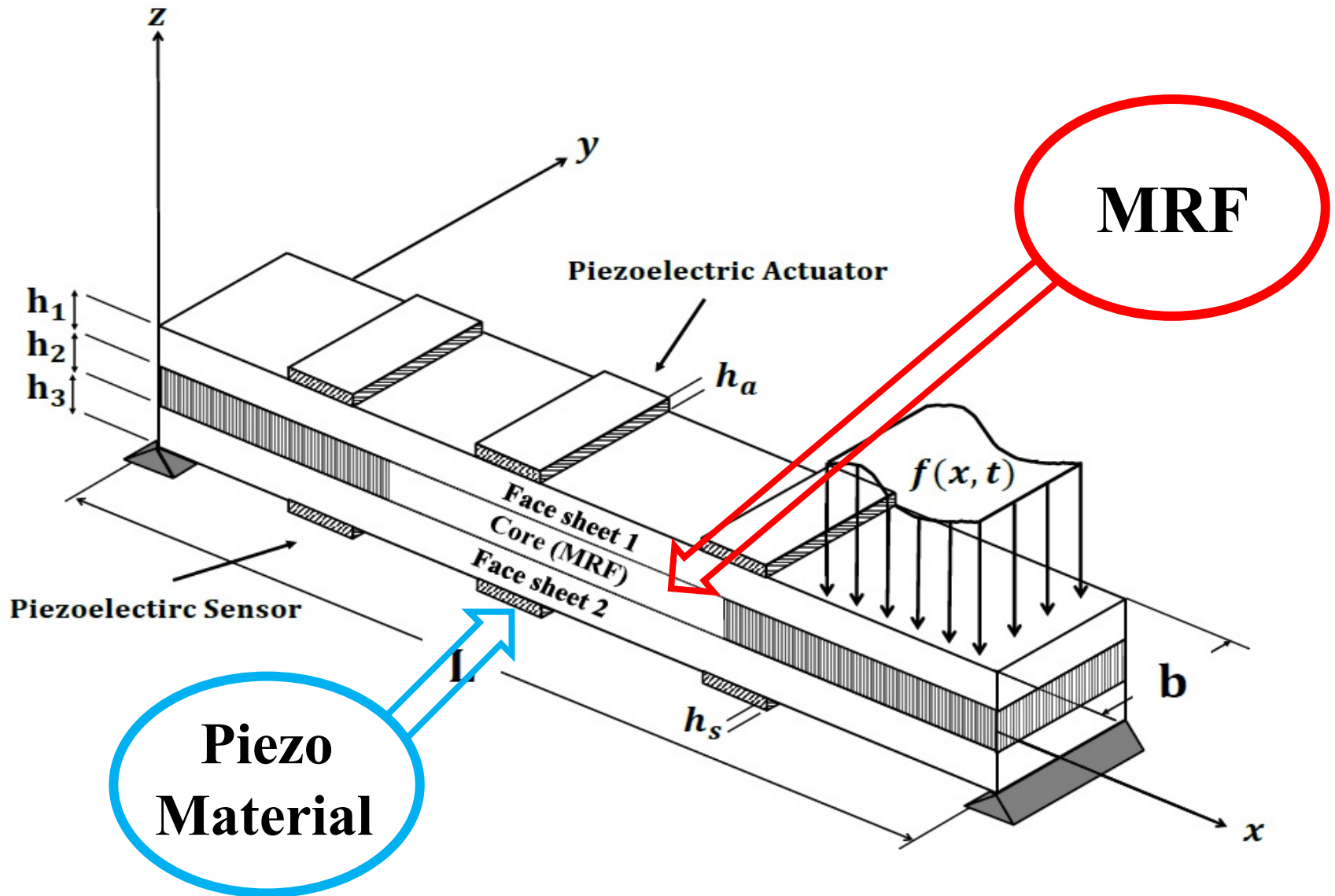
6

(months)

8

(months)

Method and Approach



Method and Approach



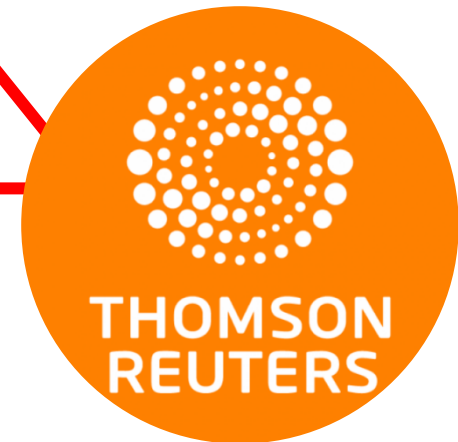
Wolfram
Mathematica

Ref [9].



Ref [10].

Validation



Ref [11].

Novelty and Originality



Novelty and Originality

- 1) Designing parameters by using many-objective genetic algorithm for smart material selection to suppress unwanted vibration and flutter.**
- 2) Developing a method in order to find the optimum numbers of actuators/sensors in a system.**
- 3) Practical application of optimally placement of MRF pocket in an engineering structure.**

Research Proposal
On

“Flutter and Vibration Control of Smart Sandwich Beam, Using Multi-Objective Optimization Method (NSGA III)”

Prepared

By: **Dr. Mohammad Nezami**
Behnam Gholami

April 2021

References

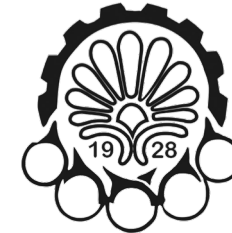
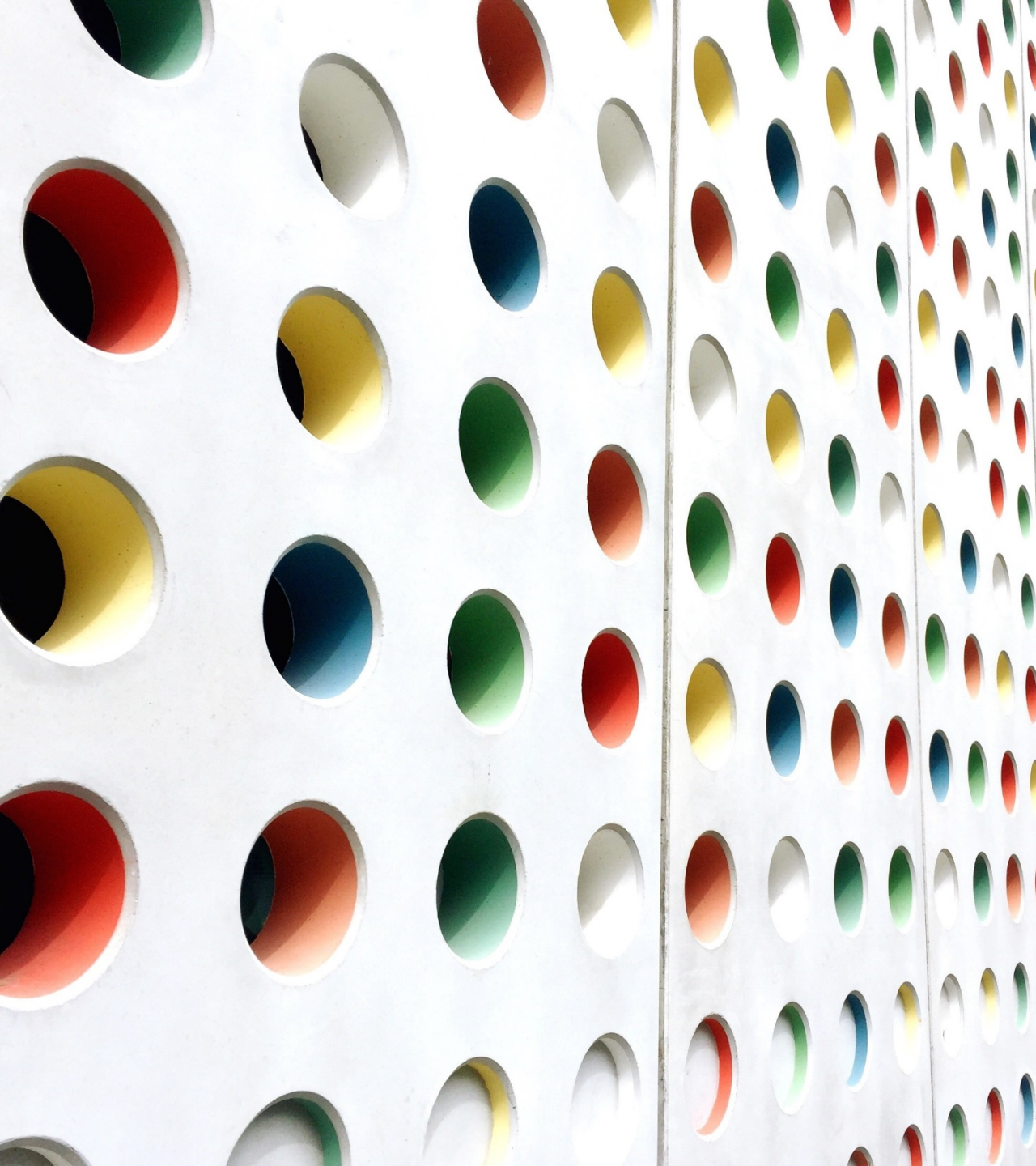


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**Amirkabir University of Technology
(Tehran Polytechnic)**

AUT - DFG

Joint Matchmaking Webinar

April 2021

Research Group CV

Dr.-Ing. Ali Yadegari



Education & Affiliation:

Ph.D. (Polymer Engineering)
Assistant professor (February 2018-Present)
Faculty of Petroleum, Gas and Petrochemical Engineering, Persian Gulf University (PGU), Bushehr, Iran

Papers:

- Probing tensile properties of LLDPE stretch films prepared in cast extrusion process (2021)
- Cavitation in irradiated and oriented high-density polyethylene cast films with stacked lamellar morphology (2018)
- Influence of precursor film microstructure on properties of HDPE microporous membranes prepared by stretching (2017)
- Correlation of crystal alignment with interphase content in oriented high density polyethylene cast films (2016)

Courses:

Heat transfer, Thermodynamics, Principles of polymer engineering, Physical and mechanical properties of polymers, Energy and mass balance

Research Group CV

Professor Dr.-Ing. Volker Altstädt



Since October 1, 2000, Professor Dr.-Ing. Volker Altstädt has headed the chair for "Polymer Engineering" at the "Faculty of Applied Natural Sciences" / "Faculty of Engineering Science" at the University of Bayreuth. Since September 30, 2020, he has been relieved of his duties as a university lecturer but is still linked to the University of Bayreuth via a service contract. He is an elected member of the German Academy of Engineering Sciences (acatech) and Executive Officer of the Polymer Processing Society (PPS).

After studying physics and obtaining his doctorate in 1987 at the "Institute for Materials Engineering" with Professor Ehrenstein in Kassel, he worked for 8 years in the "Polymer Research Division" of BASF SA in Ludwigshafen. In October 1995, Volker Altstädt was offered full professorship at the Technical University of Hamburg-Harburg, where he headed the "Plastics and Composite Materials Department" until he accepted the chair at the University of Bayreuth. Since July 2009 he has also been the managing director of "Neue Materialien Bayreuth LtD".

Research Group CV



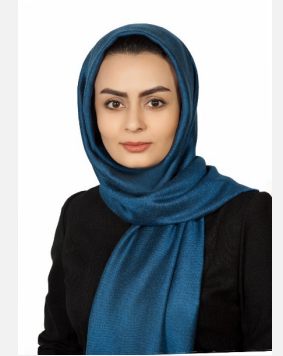
Professor Dr.-Ing. Holger Ruckdäschel

Head of Department of Polymer Engineering at the University of Bayreuth since January 1, 2021.

After studying materials science, he received his doctorate in 2009 at the chair of polymer materials under Prof. Altstädt in Bayreuth. After 13 years of industrial experience at BASF, he returned to his academic roots. At BASF, he worked in a wide range of topics and most recently headed the digital strategy of the plastics division. His other positions include polymer research and leading global roles in wind energy research and plastic additives. In recent years, he and his team have also driven digital innovations and new business models for the plastics industry.

Research Group CV

Mahboobeh Shahnooshi



Education & Affiliation:

Double degree Ph.D. student of Polymer Engineering between Amirkabir University of Technology (AUT) and University of Bayreuth. Scientific staff member, Department of Polymer Engineering, University of Bayreuth.
Batchelor of Chemical Engineering (2004-2008), AUT
Master of Polymer Engineering (2009-2012), AUT

Books:

Comprehensive Technical Guidelines for Polyethylene Pipes and Fitting (National ID 5096956), 2018.

Papers:

Rheological Rationalization of In Situ Nanofibrillar Structure Development; Tailoring of Nanohybrid Shish-Kebab Superstructures of Poly (lactic acid) Crystalline Phase, Polymer (2020).
Development of in situ nanofibrillar poly (lactic acid)/poly (butylene terephthalate) composites: Non-isothermal crystallization and crystal morphology, European Polymer Journal (2020).

Research Group Interests

- Structure-property relationship of polymers
- Polymer films (cast extrusion process, microporous films, single and multilayer films)
- Processing and compounding
- Polymer physics
- Crystal orientation (WAXD, FTIR, Raman)
- Rheology and viscoelastic properties
- Polyolefins
- Sustainable polymers
- Electric properties of polymers
- Thermal analysis of polymer blends and nanocomposites

Group Research/Industrial Projects




- Impact modification of polystyrene by blending with thermoplastic polyurethane
- Preparation of high pressure PE tubes for gas transmission
- Dynamic Creep and Fatigue Properties of Novel Elastomeric Biomaterials
- Evaluation of the structure-property-relationships of novel halloysite-polymer nanocomposites
- Production of temperature-resistant, recycled PET/PBT particle foams and clarification of the structure-property relationships in foaming and welding
- Formation and degradation of microplastics under simulated environmental influences
- Morphology control of semi-crystalline polymers through supramolecular additives
- Fundamental investigation of stress crack effects in plastic nanocomposites

Group Supervised Labs




- Rheology of polymers lab
- Thermal analysis lab
- Impact, creep and fatigue
- Polymer processing lab
- Injection molding
- Micro processing
- Additive manufacturing
- RTM and Prepreg processing
- Batch, extrusion and bead foam processing

Group Contact Information




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