

Cross-border cooperation

Supporting digitalization in the Austrian-Hungarian border region



ROBOTICS

Collaborative robotics
Mobile robotics
Drone
Industrial robotics

DATA SCIENCE/AI

ML/AI algorithms
Segmentation/Classification
Data access and visualization

EXTENDED REALITY

3D Animation
AR applications
Maintenance & Service functions

3D Technologies

3Dprinting
3Dscanning, reverse engineering
Prototype development

Cross-border digital innovation hub cooperation – Improve!

01.2020. – 12.2022.



Support SMEs in the border region of Austria-Hungary in their digitalization process.
Aim is to connect organizations that are committed to digital change.

AUSTRIA - Lower Austria

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FOTEC
Forschungsunternehmen
-der FH Wiener Neustadt-

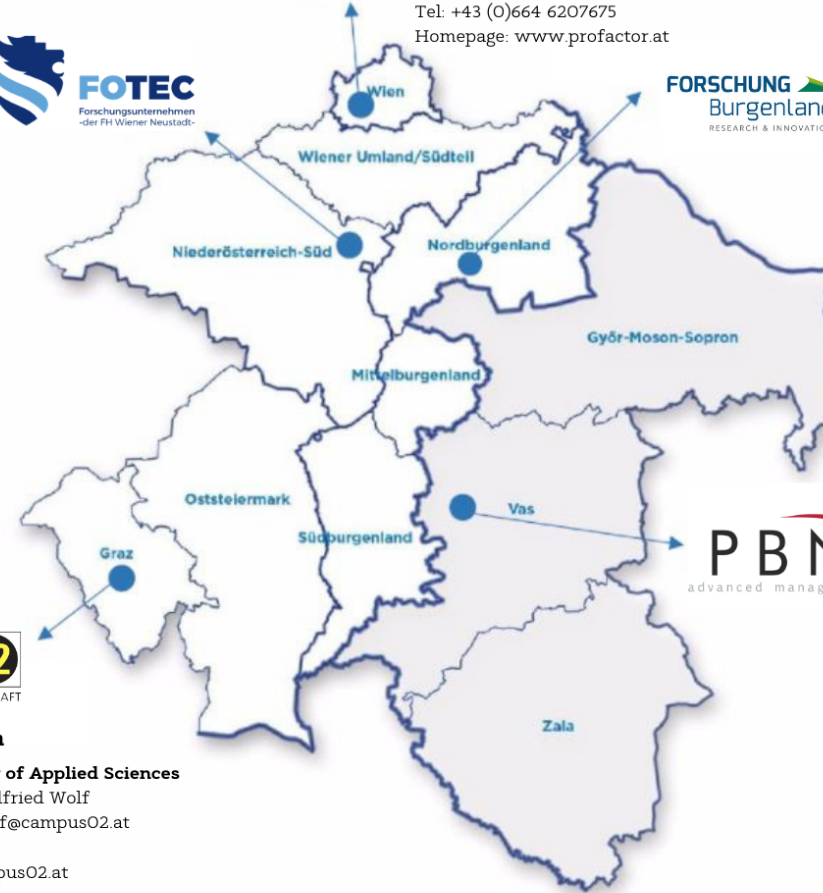
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DI (FH) Markus Hohlagschwandtner MSc.
Head of Business Engineering

Partnership competency in digitalization



Competency Review

12 application areas measured

	FOTEC	PBN	CAMPUS02	F-Burgenland	PROFACTOR	SUM
Production	19	14	21	22	16	92
Engineering	19	10	17	20	16	82
Software	23	11	20	10	15	79
AI / Machine Learning	14	22	10	11	15	72
Electronics	17	6	22	12	12	69
Health / Life	13	20	7	12	14	66
Agriculture	17	12	12	20	4	65
BlockChain	11	19	3	9	18	60
Traffic / Transport	11	13	9	12	14	59
Simulation	3	22	12	8	12	57
Energysystems	4	5	17	11	16	53
Basic research	3	1	5	8	3	20
Aerospace / Aviation	2	1	1	0	2	6



Artificial Intelligence

COMMON PROCEDURE

Neural networks

Learning rule

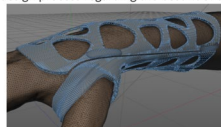
	Two-tier network	Multi-level network (hidden layer)
Supervised learning	- Delta rule	- Gradient Procedure - Backpropagation - BFGS - Levenberg-Marquardt - CG procedure
Reinforcement learning	- Temporal Difference learning - SARSA	
Unsupervised learning	- Adaptive resonance theory - Hebb'sche Learning rule	- Competitive Learning - Kohonen-Nets



Design and AM

Model development

- With the technique of direct manipulations we established the imagined product-geometry straight onto the custom „arm-object“. This method allows us to get real-time control over the whole design process regarding the best fit of the product.



VR and Robotics



Scientific SW Dev.

Practice: Use a fantasy device

Use device in Spyder console

```
from fake_instrument import FakeDevice
device = FakeDevice('bla')
device.signal
Out[3]: 1.0510933356673937
device.signal
Out[4]: 1.1181726893652855
device.gain = 0
device.signal
Out[5]: 1.1181726893652855
device.signal
Out[7]: 1.1181726893652855
```

```
device.gain = 1.0
device.mode
Out[0]: 'centered'
device.mode = 'positive'
device.signal
Out[11]: 2.0988048655103
device.signal
Out[12]: 2.9633202742240
device.signal
Out[13]: 3.8210196192540
```

```
device.reset()
device.signal
Out[15]: 0.505681902
device.signal
Out[16]: 0.728583211
device.signal
Out[17]: 1.291439980
```

21

Social Media usage

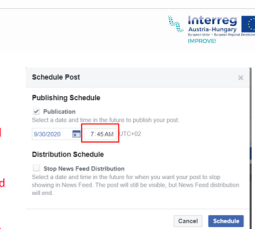
Schedule Posts

Make sure to schedule your Postings either

in the morning between 06:30 and 08:00

around noon (between 11:30 and 12:30)

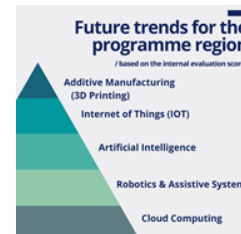
or in the evening between 18:30 and 20:00.



Future specialization

5 fields identified

Future Lab	Sum of skills
Additive manufacturing (3D printing)	24
Augmented and virtual reality, visualization	13
Blockchain	8
Circular Economy	13
Cloud Computing	14
Cross Platform Software Development	11
Digital Marketing	13
Digital Twin: Machine monitoring: Error prediction- Service level improvement	11
E-Mobility	8
Energy Systems	12
Eye-Tracking	12
Internet of Things (IoT)	24
Metal 3D printing - good integration in production chain- decentral production	11
Mixed Reality	11
Robotics and Assistive systems	15
Simulation and modelling: Near netshape cooling for injection moulds	10
AI	22
3DAnimation /3DVisualization - Democratization (access to SMEs)- Direct tool	13
Collaborative Robotics- Integration- ROS application-Industrial robot with cloud	12
3DScanning/Reverse engineering: simulation softwares integrated	10



PANNON BUSINESS NETWORK
advanced management





DI **Wilfried Wolf** MBA DI (FH) **Ioan Turcin**
Research Coordinator Assistant in Research

Customer understanding

GDPR - Financial resources - Know-how for implementation - Define goals - Implementation plan

Business Maturity Reviewed

40 reviewed publications

5 identified challenges

Technological Fields	Application Areas with Cross border relevance (5 to select)							Partners interest and competencies				
	AAL	Digital Agriculture	Advanced Manufacturing	Energy Solution and Management Systems	Digital Marketing	Green Tech	Error prediction Digital TWIN	PBN	C02	FOT	PRO	FHB
Additive Manufacturing		X	X			X		+++	+++	+++	+++	++
AI- Applications	X	X	X	X	X	X	X	++	++	+++	++	+++
CC- Datamanagement for SME		X	X	X	X	X				+		+++
IOT- 5G Applications	X		X	X		X	X	+	+++	+		++
Robotics + Assistive Systems		X	X				X	++	++		+++	++
AR, VR, MR Applications	X		X	X	X	X		+++	++	+	+++	+++
Support for Systematic Innovation	X	X	X	X	X	X		+	+++		++	+++
IOT Sensor Integration	X	X	X	X		X	X	+	+++	++		+
Area Leadership	PBN	C02	PRO	(C02)	FHB	(PRO)	FOT					
Partner Involvement	AAL	Digital Agriculture	Advanced Manufacturing	Energy Solution and Management Systems	Digital Marketing	Green Tech	Error prediction Digital TWIN					
PBN	+++	+	++		++	++						
C02		+++	++	++		++	+++					
FOT		++	+++				+++					
PRO			+++			+++						
FHB	++	+++	++	+++	+++	++						

Cross-border Working Groups

5 topics identified

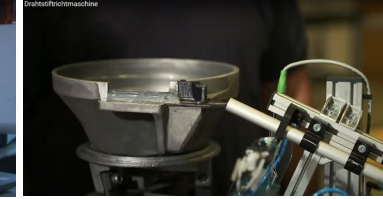
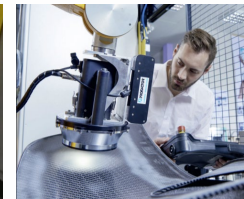
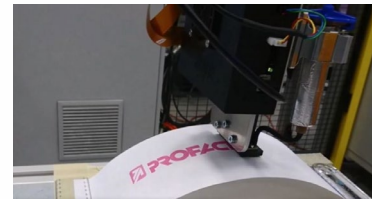
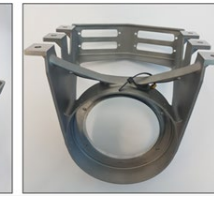
AAL – Digital Agriculture – Advanced Manufacturing – Digital Marketing – Digital Twin (error prediction)

Joint offer to the customers



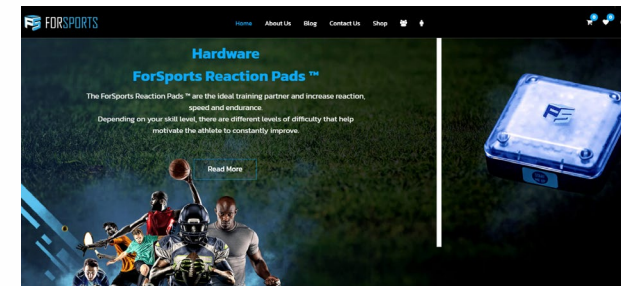
Balázs Barta MBA, **Regina Pethő MSc G.**
PhD Managing Dir. Project Manager

Case Studies to Demonstrate 17 cases shared



Pilot actions via vouchers 7+3 cross-regional winners 120-140 engineer hours

1	2	3	4
For Sports For Sports GmbH FB FB	Unit Unit FB FB	OncoLab OncoLab GmbH FOTEC FOTEC	ENPULSION ENPULSION GmbH FOTEC CO2
analyse the For Sports website / mobile application with - reaction tests for athletes with the mobile app tracking system - creating a user-friendly interface with the mobile app - user-friendly interface with the mobile app	analyse the existing website and creation of a - website for the establishment of digital marketing - website for the establishment of digital marketing - website for the establishment of digital marketing	Testing Monitor and in the field of industrial knowledge should not only be in control - of the process, but also in the - of the process, but also in the - of the process, but also in the	Thermal conductivity measurement of the - of the process, but also in the - of the process, but also in the - of the process, but also in the
Services	Services	Services	Services
3D animation (the product development and marketing control)	x	x	x
Collaboration robotics Mechatronics Engineering Mechatronics Engineering Mechatronics Engineering	x	x	x
AR - Augmented Reality AR - Augmented Reality AR - Augmented Reality	x	x	x
Quality testing Quality testing Quality testing	x	x	x
Material Analysis Material Analysis Material Analysis	x	x	x

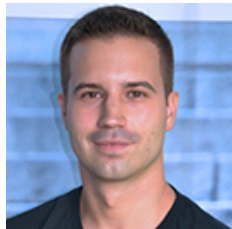


Around the world, we have strong and reliable partners in the academic and commercial sector to pool our resources and forces:



PANNON BUSINESS NETWORK
advanced management





Nicole Zemlyak
BA, MA
Project Manager

Thomas Kremsner
BA, MA
Project Manager



Visibility and Awareness



Christian Wögerer
DI, MSc
Coordinator of
international network



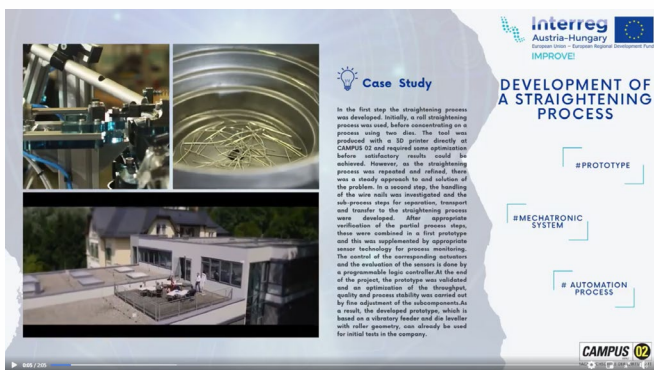
17 videos + leaflets about the case studies

Call for pilot projects

Presence in national press of FLC



Extension of DIH Network and
European/Cross-border/Regional connectivity



Stakeholder database

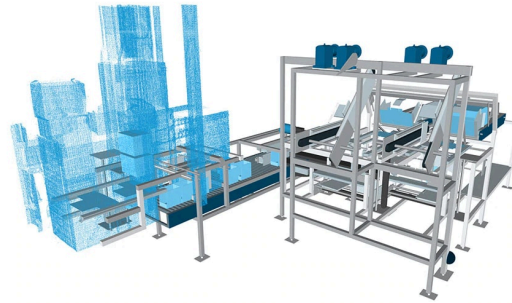
Dialogue

Flagship projects for 2021-2027



New shared digitalization infrastructure

Cyber-Physical Factory
launch



Training materials jointly
developed

Application of multiple digitalization solutions – Cybersecurity with Forschung Burgenland

Thank you for your attention.

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www.pbn.hu

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