

D2.2 Second report on twinning and networking activities

Reporting period:

Due date of deliverable	M24
Actual submission date	
Organisation name of lead beneficiary for this deliverable	TU/e
Dissemination Level	PU
Start date of project	1.10.2022
Duration	36 months

Responsible organization:	Technical University of Eindhoven (TU/e)
Authors:	Esin Ilhan Caarls
Version:	Version 1

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1. HISTORY OF CHANGES

No.	Chapter	Change	Page
1.			

2. ABSTRACT

All 4 group activities have been reported in separated documents. These documents summarize the exploratory meetings (face-to-face and online), where research subjects have been discussed, interests and the objective of the group as part of the DITARTIS were defined.

3. ACTIVITIES CARRIED OUT DURING THE REPORTING PERIOD

In this period of the project, the 4 research workgroups (RWG) have continued with the twinning and networking activities.

Research workgroups exploratory meetings:

All 4 research work groups (RWG) have individually organized and finished their exploratory meetings in the previous reporting period.

Please see the specific activity report for the details in the Annex.

Research workgroups working meetings:

Research work group working meetings have taken place in this reporting period. Please see the specific activity report for the details in the Annex.

Short term-expert visits:

Related short term visits are reported below under specific RWG. Please see the specific activity report for the details in the Annex. Additionally, a twinning and networking activity is organized by TU/e under this category.

Twinning and networking activity via industry involved experts:

As the WP leader for twinning and networking, TU/e offers to the DITARTIS consortium members and all involved researchers online/hybrid courses, which are jointly prepared and given by part-time industrial experts and TU/e academic staff. The experts are related to companies such as Bosch, TNO and Philips. Since the duration of the expert courses cover a large span November 2024 to May 2025, the courses are given in a hybrid form. The organizational issues to enable an efficient attendance of DITATIS members for these courses took in this reporting period place. This includes facilitating hybrid communication platform, access to the necessary software and documentations and interaction channels via MS Teams to maximize interaction. The courses will occur in the next reporting period.

The following list is the participants who will join the courses, which includes practical assignments related to the following topics: sustainable vehicle development, data-driven electrical machine condition monitoring, charging systems, parameter estimation techniques of batteries and advanced numerical methods for electromagnetic devices:

5LWF0 and 5AT010 course enrolment for Ditartis members

Nasibulina, **Nailia**
To: @Grop, Dave, @Ilihan Ceart, Erin
Cc: @Lomonova, Elena, @Jildema, Gerlof
Mon 10/28/2023 2:03 PM

High importance

Dear Eain, dear Dave,

Here is a list of the students who would like to enrol in your courses as part of the Ditartis project.

	University	Student Name	Email address	Supervisor	Email address supervisor
Fem for electromagnetic devices (5LWF0)	Siemens Industry Software	Robert Szabo	robert-matei.szabo@siemens.com	Calin Husar	calin.husar@siemens.com
	Siemens Industry Software	Flavius Paduraru	flavius.paduraru@siemens.com	Calin Husar	calin.husar@siemens.com
	Technical University of Cluj Napoca	Paula Petrescu	paula.petrescu@amd.utcluj.ro	Claudia Martis	Claudia.Martis@amd.utcluj.ro
Electrical components (5AT010)	Typhoon HIL	Dusanka Sudar (MSc)	dusanka.sudar@typhoon-hil.com	Jelena Trickovic	jelena@typhoon-hil.com
	Siemens Industry Software	Robert Szabo	robert-matei.szabo@siemens.com	Calin Husar	calin.husar@siemens.com
	Siemens Industry Software	Flavius Paduraru	flavius.paduraru@siemens.com	Calin Husar	calin.husar@siemens.com
	Technical University of Cluj Napoca	Raymond Birasa	Raymond.Birasa@amd.utcluj.ro	Claudia Martis	Claudia.Martis@amd.utcluj.ro

Could you please register them for your courses and let me know if you need any additional information or assistance from my side?

Thank you!

Kind regards,
Nailia

TU/e Eindhoven University of Technology
Vacancies available at EPE

Nailia Nasibulina, MSc, PDeng
Project Program Manager and Doctor
Fac. Electrical Engineering
Flux 2.110
De Zijk
Postbus 113
5600 MB Eindhoven
T +31 (0)402473555

Figure 1: List of participants for the Expert courses

Exchange forums

Consortium members jointly attended the 27th edition of the International Symposium on Power Electronics, Electrical Drives, Automation and Motion ([SPEEDAM](#)) 19-21 June 2024 in Ischia, Italy.

A dedicated Exchange forum was held for Ditartis in form of a special [DITARTIS session](#) focusing on Digital Technologies and AI Solutions on 21th June, where researchers presented their work related to DITARTIS project. Additionally, the members introduced themselves, their activities and work focus of Ditartis to the external researchers outside of the project during the networking events in the conference.



Figure 2: Exchange forum organized as a special session in SPEEDAM conference

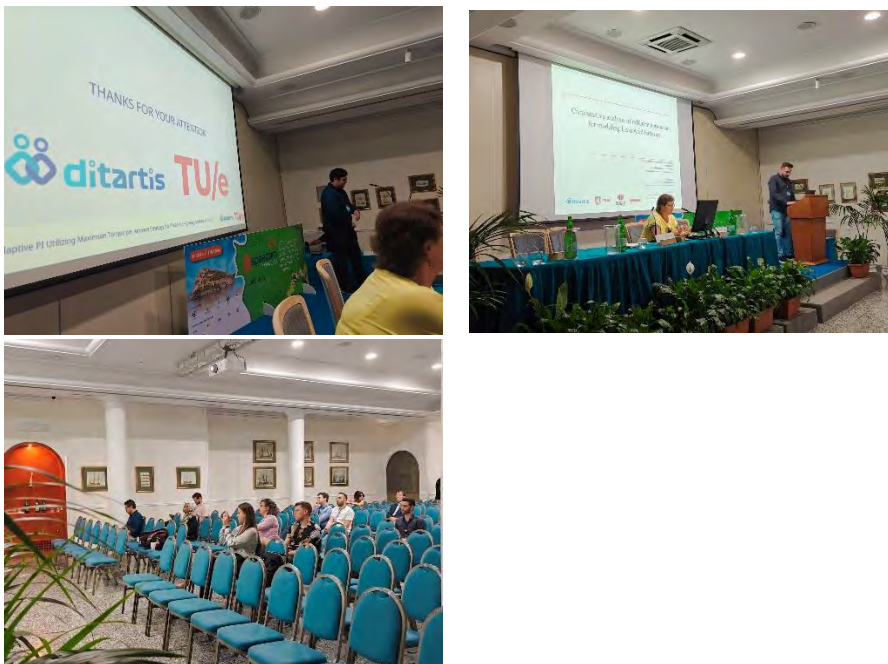


Figure 3: Impressions from DITARTIS exchange forum

Conferences and events outside consortium attendance

Conferences and events outside of consortium attendance are reported below under specific RWG. Please see the specific activity report for the details in the Annex.

- **RWG3:**
- [AABC](#) Battery conference, 13-16 May 2024, Strasbourg France, Essam Arifi, Poster presentation

- Conference on Electromagnetic Field Computation (CEFC), Post-processing-based Flux-weakening Control of Variable Flux Reluctance Machines. Doğa Ceylan; Konstantin O. Boynov; Elena A. Lomonova

4. DEVIATIONS FROM THE WORKPLAN

No deviations are reported from the workplan.

5. ANNEX (ACTIVITY REPORTS)

Research workgroup RS1 (RWG1):

Flexible and adaptable AI & digital solutions for renewable-based electrical energy sources, storage, and smart household and building equipment and devices integration in smart building, houses and nanogrids

Research workgroup leaders: Ioana Cornelia Gros

Reporting period: June 2023-June 2024

Meetings:

Results:

- Scientific papers

“Artificial intelligence (AI)-based optimization of power electronic converters for improved power system stability and performance” by **Ioana Cornelia Gros, Xiaoshu Lü, Claudiu Oprea**, Tao Lu, Lucian Pintilie, published in *2023 IEEE 14th International Symposium on Diagnostics for Electrical Machines, Power Electronics and Drives (SDEMPED)*, 28-31 Aug. 2023, DOI: [10.1109/SDEMPED54949.2023](https://doi.org/10.1109/SDEMPED54949.2023)

- Identification of interesting calls

- New proposals

- Short visits

Participation of Ioana-Cornelia Gros to *2023 IEEE 14th International Symposium on Diagnostics for Electrical Machines, Power Electronics and Drives (SDEMPED)*, Crete, Greece, 28-31 Aug., with the presentation of the article “Artificial intelligence (AI)-based optimization of power electronic converters for improved power system stability and performance”.

- Expert visits

- Young researchers and students mentoring

- Participation to *Ditartis Online Workshop – “Publication and proposal grant application”* - 30.06.2024

Future work:

1. Short visits to the partners
2. Produce more scientific papers.
3. Jointly apply more EU projects.

Research workgroup RS2 (RWG2):**AI-based demand side management architecture****Research workgroup leaders:** Miadreza Shafiekhah, Adrian Augustin Pop

Research workgroup RS3 (RWG3):**AI-based electrical machines and drives (design, analysis, control, testing)****Reporting period: September 2023- June 2024****Meetings:****Type of the meeting: online, 25 Jan 2024****Attendees:**

Wilkins, S. (Steven) <steven.wilkins@tno.nl>;

Wilkins, Steven <swilkins@tue.nl>;

Mircea RUBA <Mircea.RUBA@emd.utcluj.ro>;

Meulenbroeks, Tim <t.a.j.meulenbroeks@tue.nl>;

Arifi, Essam <e.a.f.a.arifi@tue.nl>;

Paula Ioana SERBAN <Paula.Serban@emd.utcluj.ro>;

Teodor Sebastian URSACHE <Sebastian.Ursache@emd.utcluj.ro>

Agenda:

There are currently, different projects are running on the battery topics at TU Eindhoven and TU Cluj. Ditartis will enable an opportunity to explore common interests and collaborate on possible topics. All related researchers introduced themselves and their research topic in this meeting.

- Max. 7 min presentation per PhD, followed by Q&A
 - The content of your presentation included Topic, Why this research?, Research questions, Any relation to larger projects
- Technical content discussions:
 - Mention one technical bottleneck, PhD encountered until now
 - How is this issue solved/is going to be solved, or would you like to ask to the group.
- Expectations:
 - What would be the expectation from this collaboration, how can we help you best in your research?

Action points:

Set-up MS Teams...

Follow-up: Publicly available Datasets for Battery (performance, degradation) (Circulate among the researcher)

Publications, conference, lists.

Test-setup development.

Type of the meeting: online, 22 Feb 2024**Attendees:**

Esin Ilhan Caarls e.ilhan@tue.nl

Sergio Costa [<sergio.costa@typhoon-hil.com>](mailto:sergio.costa@typhoon-hil.com);

Bayazit, Göksenin Hande [<g.h.bayazit@tue.nl>](mailto:g.h.bayazit@tue.nl);

Escárate Muñoz, Juan [<j.d.escarate.munoz@tue.nl>](mailto:j.d.escarate.munoz@tue.nl);

Zerina Dzombic [<zerina.dzombic@typhoon-hil.com>](mailto:zerina.dzombic@typhoon-hil.com)

Topic:

-How to collaborate

-Lending/loaning or donating

-Timeline (early May)

- Educational and research expectations and plans.

Action points:

- To send the documents (from Typooon side..)

Type of the meeting: online, 29 Feb 2024**Attendees:**

Wilkins, S. (Steven) <steven.wilkins@tno.nl>;

Wilkins, Steven <swilkins@tue.nl>;

Mircea RUBA <Mircea.RUBA@emd.utcluj.ro>;

Meulenbroeks, Tim <t.a.j.meulenbroeks@tue.nl>; (Holiday)

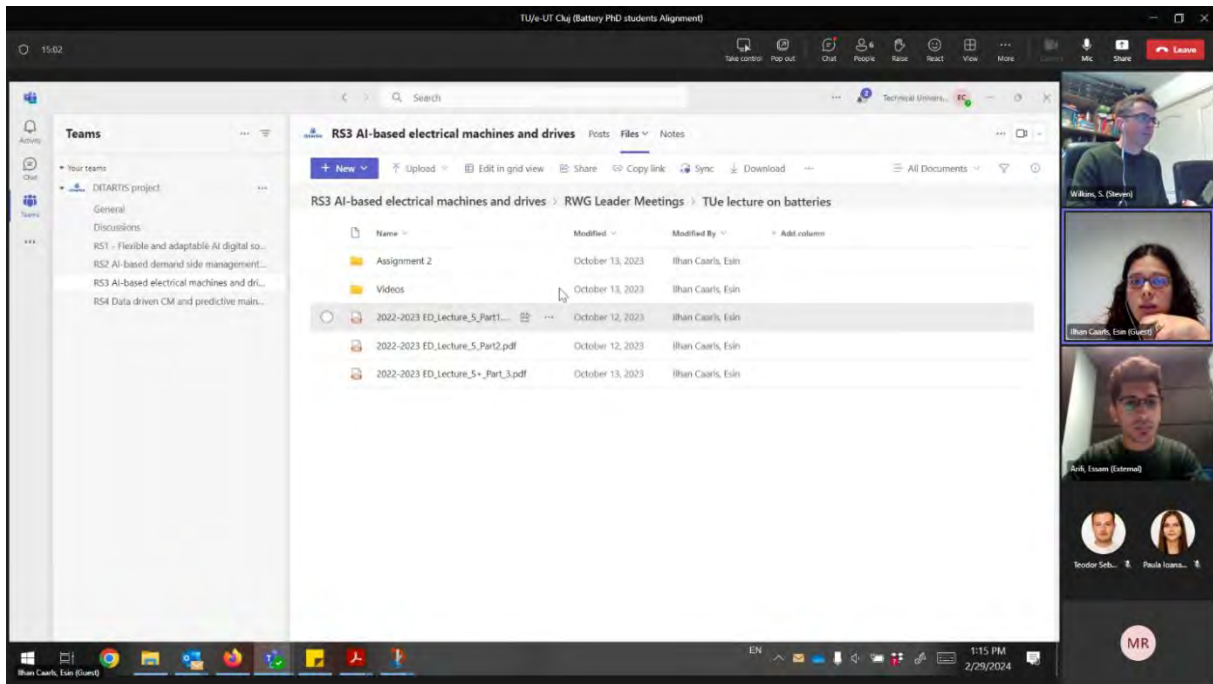
Arifi, Essam <e.a.f.a.arifi@tue.nl>;

Paula Ioana SERBAN <Paula.Serban@emd.utcluj.ro>;

Teodor Sebastian URSACHE <Sebastian.Ursache@emd.utcluj.ro>

Agenda:

- Announcement on upcoming battery conference:
 - o <https://www.advancedautobat.com/aabc-europe>
 - o Decision for joint Poster.
 - o TU/e will start
 - o Working folder:
 - o <https://didatec.sharepoint.com/:f:/r/sites/DITARTISproject/Shared%20Documents/RS3%20AI-based%20electrical%20machines%20and%20drives/RWG%20Leader%20Meetings/Publications/AABC-Europe%20-Poster?csf=1&web=1&e=aByysl>
- New folder structure is introduced (Ditartis teams channel)
- Upcoming Speedam conference publications are discussed
 - o Cluj--> Battery
 - o TU/e --> Motor
- Technical discussions on battery testing is shared, lab experience, lessons learned, upcoming plans.



TU/e-UT Cluj (Battery PhD students Alignment)

15:52

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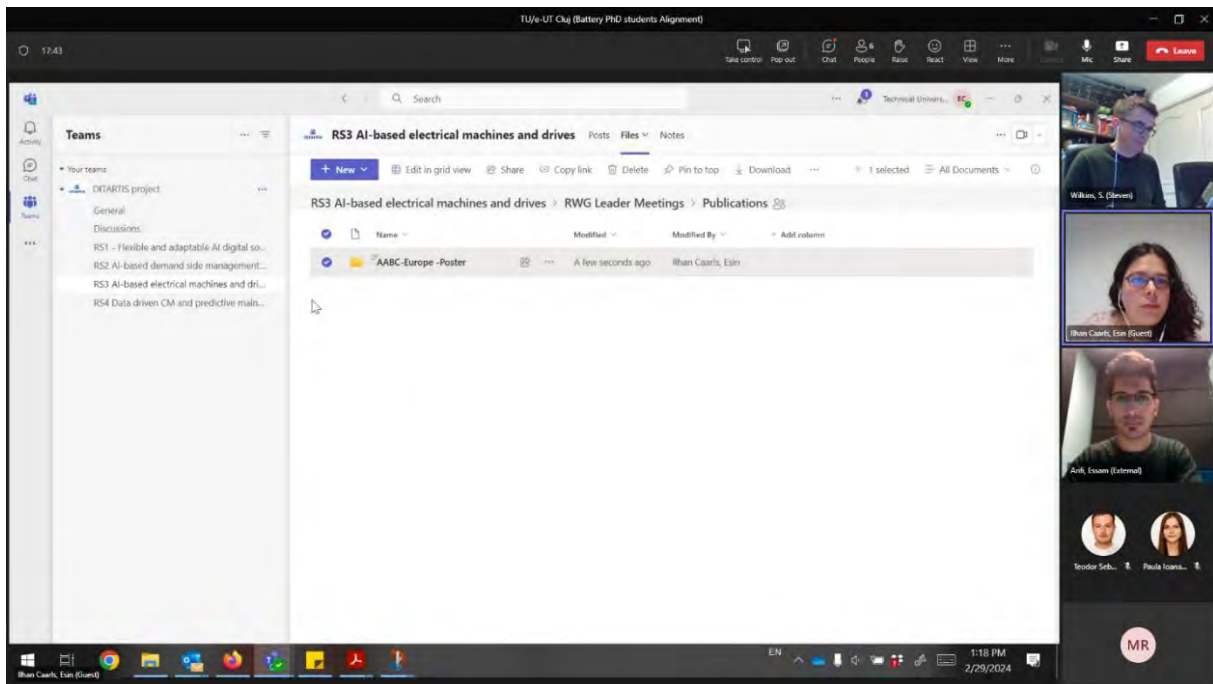
Teams

RS3 AI-based electrical machines and drives

RS3 AI-based electrical machines and drives > RWG Leader Meetings > TUe lecture on batteries

Name	Modified	Modified By	Add column
Assignment 2	October 13, 2023	Ihan Caeris, Esin	
Videos	October 13, 2023	Ihan Caeris, Esin	
2022-2023 ED_Lecture_5_Part1...	October 12, 2023	Ihan Caeris, Esin	
2022-2023 ED_Lecture_5_Part2.pdf	October 12, 2023	Ihan Caeris, Esin	
2022-2023 ED_Lecture_5+_Part_3.pdf	October 13, 2023	Ihan Caeris, Esin	

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2/29/2024



TU/e-UT Cluj (Battery PhD students Alignment)

17:43

Technical Uniers...

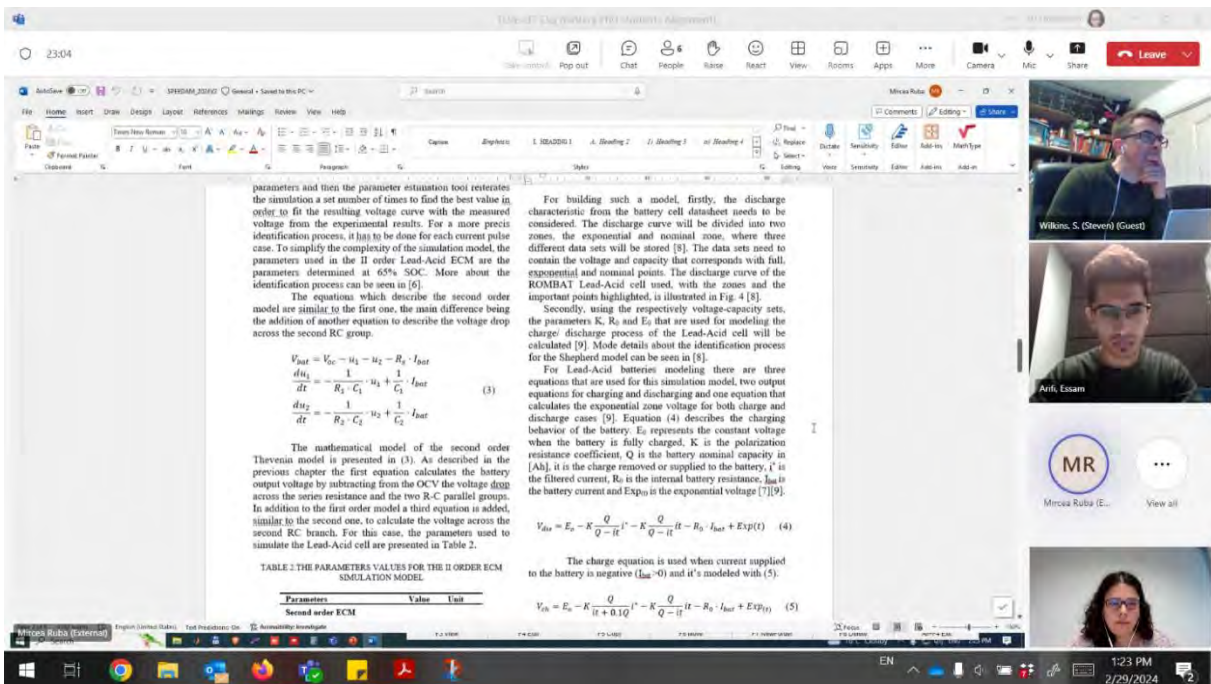
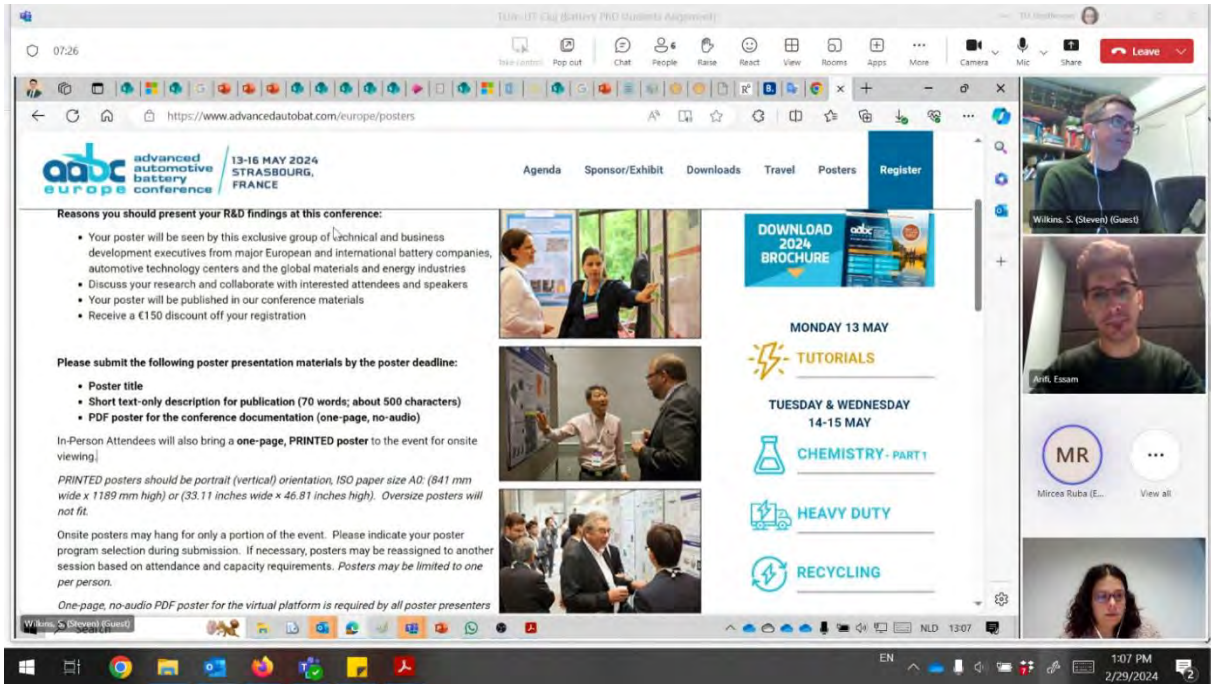
Teams

RS3 AI-based electrical machines and drives

RS3 AI-based electrical machines and drives > RWG Leader Meetings > Publications

Name	Modified	Modified By	Add column
AABC-Europe -Poster	A few seconds ago	Ihan Caeris, Esin	

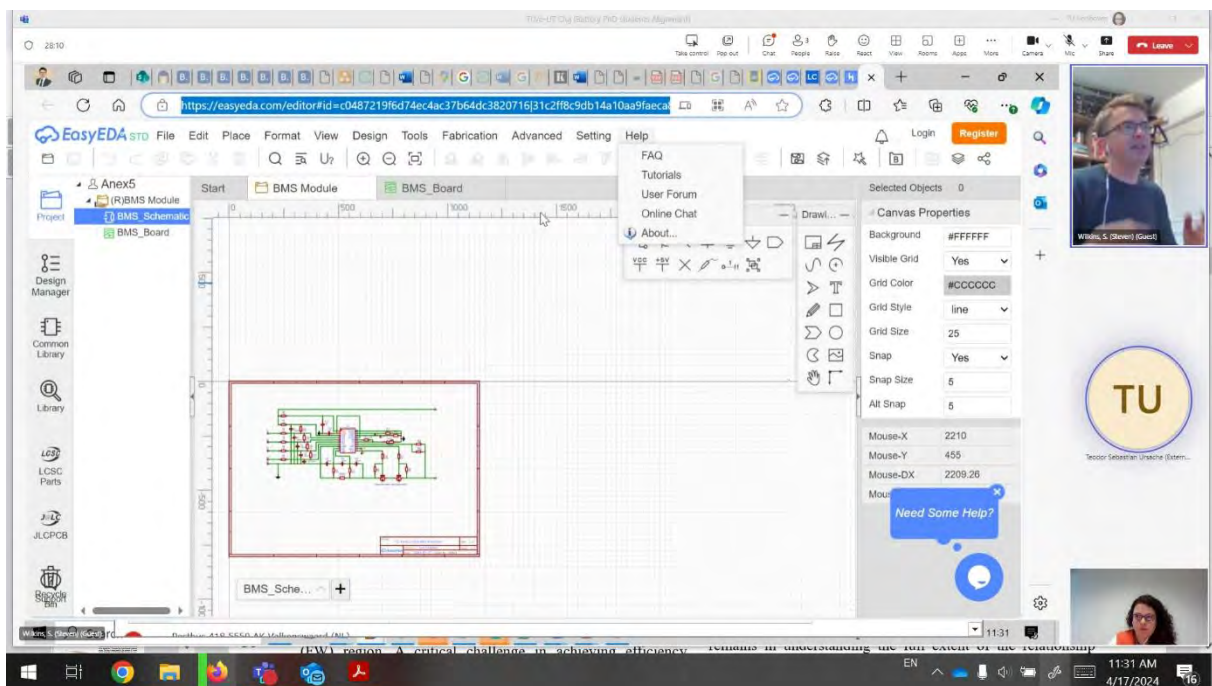
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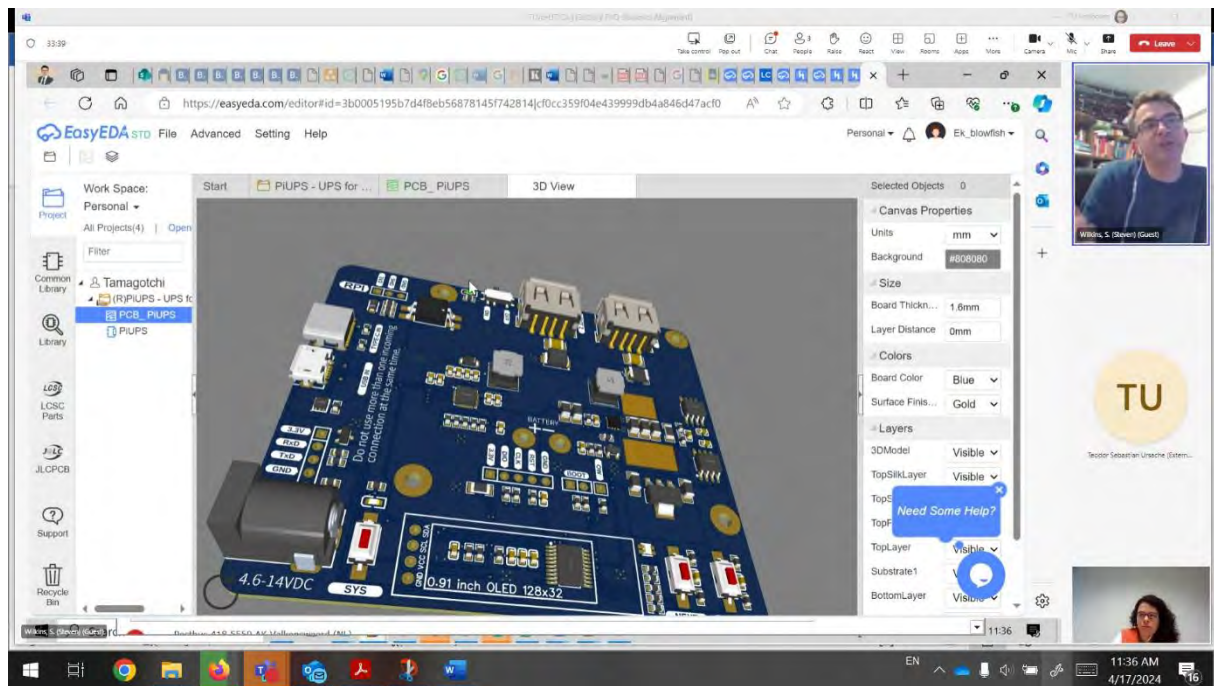


Type of the meeting: online, 17 April 2024

Esin, Steven, Teodor Sebastian Ursache, (Mircea last minute hospital), Essam (conference attendance)

- Question from Sebastian regarding the use of Litium Ion and Lead acid batteries, in which direction the industry and research is going
- Information/demonstration from Steven (expert) on joint PCB development software platforms which could be used between institutions to promote joint work,e.g.
 - o More people can work
 - o Free public tool, open source, EasyEDA, OSHWLab (open source hardware lab)
 - o Aim could be to develop a “simple” BMS system.
 - o Examples are publicly available from other
- Discussion on local industry and global industry directions. What are the preferences.
- Differences in PhD project finances between countries, how these effect the research directions





Type of the meeting: online, 30 May 2024

Attendees: Mircea, Esin, Steven

Topics:

Connecting possible topics, and projects on Lead -Acid batteries (NL-Romania)

Technical discussions on mounting PCB on battery application

Discussions on Battery passport, role and place of Lead-Acid batteries.

Technical discussions on battery simulations, measurements,

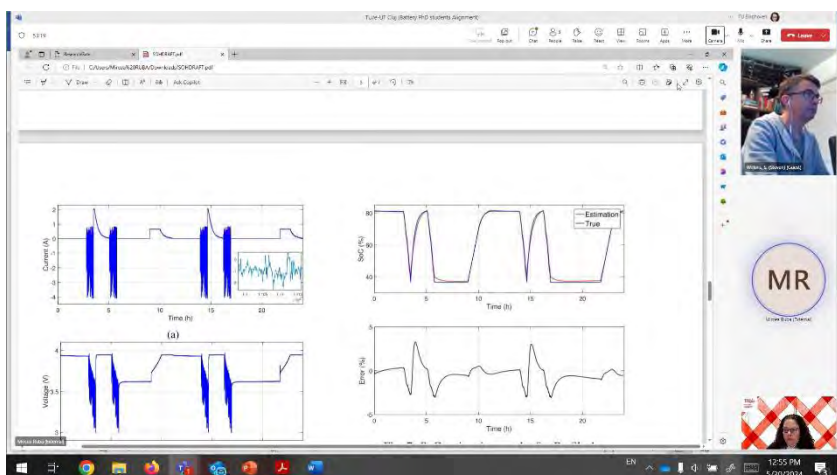
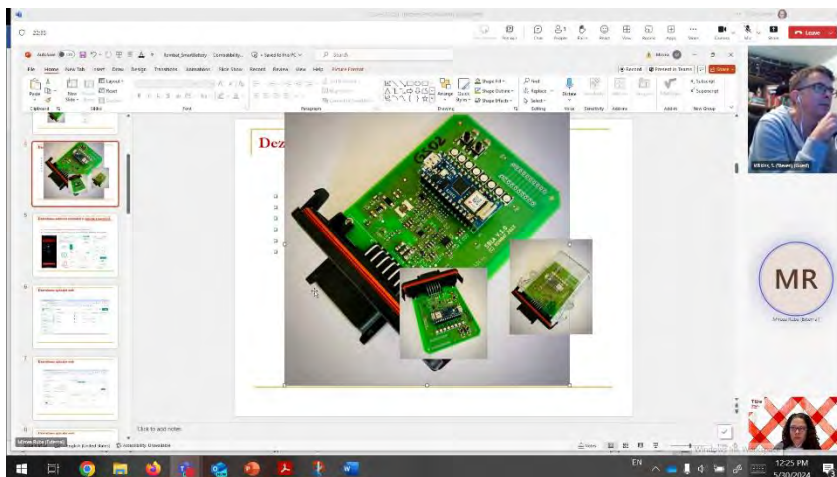
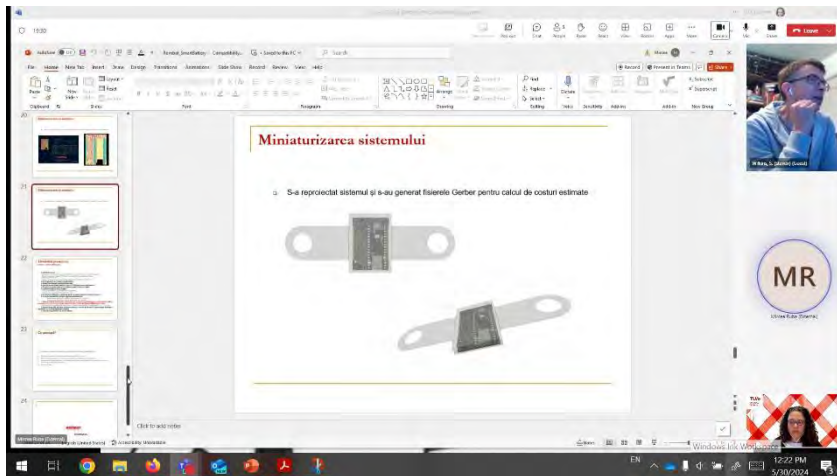
Exchange of current activities

Future roadmap plans

Next:

The last regular meeting.

The next meetings will be planned upon asking for a specific question.



Research workgroup RS4 (RWG4):

Data driven condition monitoring and predictive maintenance in EMS

Research workgroup leaders:

Jose A. Antonino-Daviu

Jose E. Ruiz-Sarrio

Sorin Cosman

Mazaher Karimi

Research workgroups: RWG4**Research workgroup leaders:**

Jose A. Antonino-Daviu

Jose E. Ruiz-Sarrio

Sorin Cosman

Mazaher Karimi

Reporting period: May2023 – September2023**Meetings: RWG4 leader meeting**

Type of the meeting: online

Date of the meeting: February 27th

Participants: Sorin Cosman, Jose A. Antonino-Daviu, Jose E. Ruiz-Sarrio, Mazaher Karimi

Short minute of the meeting: Decisions about first exploratory meeting and short introduction of the research groups

Meetings: EM1

Type of the meeting: online

Date of the meeting: March 28th

Participants: Sorin Cosman, Jose A. Antonino-Daviu, Jose E. Ruiz-Sarrio, Mazaher Karimi, Sorin Cosman, Daniela Sasu, Razvan Bocu, Alexandra Baicoianu, Meysam Pashaei

Short minute of the meeting: Exploratory Meeting 1, presentation about the main research lines and interest of the different involved research groups.

Meetings: EM2

Type of the meeting: online

Date of the meeting: March 28th

Participants: Jose A. Antonino-Daviu, Jose E. Ruiz-Sarrio, Mazaher Karimi, Daniela Sasu, Razvan Bocu, Alexandra Baicoianu, Meysam Pashaei, Pedro Llovera-Segovia.

Short minute of the meeting: Exploratory Meeting 2:

1. Identification of specific links between partners. Presentation from each of the partners.
2. Identification of calls of interests. Hydropower. Contact Claudia to explore further involvement.
3. Setting unilateral meetings between partners to explore specific topics for collaboration before EM3.

Meetings: EM3

Type of the meeting: online

Date of the meeting: March 25th

Participants: Jose A. Antonino-Daviu, Jose E. Ruiz-Sarrio, Mazaher Karimi, Daniela Sasu, Razvan Bocu, Alexandra Baicoianu, Meysam Pashaei,.

Short minute of the meeting: Exploratory Meeting 3:

4. Further identification of specific links between partners. Presentation from each of the partners.

Results:

Updates of on-going collaborative research and possible new collaboration.

Future work:.

The next events (i.e., WMs, EFs) are organized at a consortium level.

Further collaborations between members are forecasted as well as jointly scientific publications.