Activity Report 2023

The International Research & Innovation Centre for Digital Intelligent Systems IRIXYS relies on the close cooperation between the University of Passau (Germany), the University INSA Lyon (France), the University of Milan (Italy) and since 2019, the University of Pau et des Pays de l'Adour (UPPA) in France. IRIXYS activities are based on three pillars.

Firstly, IRIXYS supports academic exchanges, including the implementation of double master's degrees and Cotutelle doctorates, the organisation of workshops for young researchers and the organisation of academic summer schools.

Secondly, IRIXYS makes sure to forge a strong partnership with industry (ATOS, Siemens, etc.) and institutional actors.

Thirdly, IRIXYS relies on top joint research, currently being carried out in the fields of big data analytics, artificial intelligence and IT security, focusing on transversal axes: environmental impact, green IT; ethics, trust and protection of private life; numerical sovereignty and open science.

In 2023 the IRIXYS consortium carried on the profound reflexion on the future orientation and development of the common research program initiated in 2022 and started implementing a new agenda toward a more sustainable organisation.

Moreover, the year 2023 celebrated two jubilees. On the first hand, the 15th anniversary of the MDPS/IRIXYS cooperation celebrated in Lyon and Passau and on the other hand, the 60th anniversary of the Elysée-Treaty, strongly reaffirming the German-French friendship and collaboration.

The purpose of this document is to report on all activities undertaken in 2023 by and in cooperation with IRIXYS and to assess to which extent this ambition has been fulfilled.

https://irixys.uni-passau.de

Contents

1. Academic and Scientific Collaboration

1.1. Consolidation of our academic collaboration

> ➤ *IRIXYS PhD Track*

The "IRIXYS PhD Track" between the University of Passau and INSA Lyon and supported by the French-German University (UFA/DFH) was conceived to stimulate a bi-national academic postgraduate path: from the start of a Master to potentially achieving a PhD. In 2023, many students have undertaken a double Master and two graduates are about to begin doctoral studies (associate doctorates).

In 2023 eight students from INSA Lyon could come to Passau for the first time to pursue their studies in March 2023. Four of the newcomers completed their Masters in Passau in 2023, while the four others decided to stay one more semester to fully maximise their experience in Germany. In September 2023 four students of the University of Passau started a PhD Track and begun their studies at INSA Lyon.

In the frame of the course dedicated to the double-Master students "working as an IT manager in France, Germany/Bavaria", the social bound was maintained and the group spirit was strengthened through several group activities (welcome evening, experience of the local food, meeting with the future double-Master students, participation to the IRIXYS Young Scientists' Winter Workshop).

Furthermore, the four years funding cycle of the PhD Track was successfully reconducted in 2023. The submission even got in the top best ranking of all programs, celebrating the excellence of the cooperation between the university of Passau and INSA Lyon.

➢ *Cotutelle de thèse*

In 2023, the Chair of Distributed Information Systems of the University of Passau counted four students in cotutelle de thèse (PhD in supervision) with INSA Lyon: Alaa Alhamzeh, Paul Lachat, Ashish Ashutosh and Felix Bölz. On May 15th 2023 in Lyon, Alaa Alhamzeh successfully passed her defense on "*Language Reasoning by means of Argument Mining and Argument Quality",* in front of a binational jury. The whole IRIXYS team is very proud of the academic path of Dr. Alaa Alhamzeh.

Though no students officially begun a cotutelle de thèse this year, two former students should officially undertake (one cotutelle and one associate PhD) their doctoral studies in 2024.

https://irixys.uni-passau.de

> ➢ *Double-Master University of Passau and ENSIIE Paris/Evry*

In September 2023, three students from Passau started the double degree at ENSIIE and in March 2023, the university of Passau welcomed two Erasmus + exchange students from ENSIIE.

Furthermore, the current funding period of the Double Master is soon ending and the binational team answered the UFA/DFH call to prolongate the funding for another four years cycle. This was the opportunity to further discuss and strengthen the cooperation, since the two institutions are partners in the Reform project (EU Call European University Alliances).

1.2. Consolidation of our scientific collaboration

The IRIXYS members (former MDPS collaboration) have been organising since 2008 biannual workshops hosted and organised in turn by the three main partners: the University of Passau, INSA Lyon and the University of Milan. During the Young Scientists' workshops, each doctoral student presents the progress of his/her thesis and the results obtained since the last workshop. All the participants (between 30 and 40 people, researchers and PhD students, from the IRIXYS centre teams, international experts, industrial partners) can thus follow, on a regular basis, the progress of all the IRIXYS PhD students, analyse the results, suggest new investigation and cooperation.

These research workshops, by their regularity and size, catalyse a strong dynamic among the PhD students and reinforce their motivation to advance rapidly and regularly in their research in order to be able to present interesting results during their presentations. They thus form a series of milestones for the students, the researchers and professors to structure the progress of their research.

Normally (when the global sanitary situation allows it) the IRIXYS workshops are organised face-to-face, which is an integral part of the Franco-German-Italian intercultural experience, it enables everyone to dedicate their full attention to the different activities, workshops and meetings and of course it creates a strong group cohesion.

During the two Young Scientists' Workshops of 2023, the consortium celebrated the 15th anniversary of the MDPS/IRIXYS cooperation and the 60th anniversary of the Elysée-Treaty.

https://irixys.uni-passau.de

➤ *IRIXYS Young Scientists' Spring Workshop in Lyon and 15ᵗʰ years of MDPS/IRIXYS*

10ᵗʰ – 15ᵗʰ of May 2023 at INSA Lyon

The IRIXYS Young Scientists' Spring Workshop hosted by INSA Lyon, took place in person. Some 35 students and professors from INSA Lyon, University of Passau, University of Milan and University of Pau participated. Besides the contribution of the doctoral candidates and the presentation/update of their work, this workshop week focused on cybersecurity. Indeed, in the frame of the 15ᵗʰ anniversary of the cooperation, the team organised a round table and keynote speakers on industrial and academic cooperation (research, innovation and education) in the field of cybersecurity with French, German and Italian experts. The discussion was thought-provoking and the participants could share their point of views. Furthermore, it was also the occasion to look back on the cooperation with testimonies from "old" and "new" IRIXYS members and partners. The German-French long-standing collaboration was especially gratified with some warm words from the Consul of Germany in Lyon Christiane Rump; the president of the DFH/UFA Prof. Dr. Philippe Gréciano; Prof. Dr. Hervé Martin, Attaché for science and education at the French Embassy; and Axel Honsdorf, CEO of BayFrance.

https://irixys.uni-passau.de

➢ *IRIXYS Young Scientists' Winter Workshop in Passau*

27th of November – 1st of December 2023 at the University of Passau.

The IRIXYS Young Scientists' Winter Workshop in Passau focused on cybersecurity, AI, health and green IT. With a total of 40 participants from the universities of Passau, Lyon, and Milan, it provided a great opportunity for students to present their respective topics and receive expert opinions. The workshop took place over a week with a full program with fruitful exchanges and team-building activities, such as the visit of the snow-covered Christmas Market. One of the highlights of the workshop, however, was the international Hackathon/Data challenge organized by the chairs of Prof. Kosch and Granitzer which brought very good results and concluded with an award ceremony featuring contributions from well-known figures in the field of European research and academia (for more information of the Hackathon/Data Challenge, see section 2.2).

https://irixys.uni-passau.de

➢ *The IRIXYS Board Meeting*

On May 11th the IRIXYS Board Meeting took place in Lyon in presence of the internal team of professors from the involved universities and some industrial, educational and political key actors of the cooperation (see Board Meeting minutes attached to this document). The discussion resulted in very positive synergies between the members and concrete new orientations for the cooperation and for its sustainability. The missions of IRIXYS have been redefined in three dimensions:

- Innovation and research: Fundamental and applied research focused in innovation ("looking ahead") and with transversal topics;
- Education: Scientific and professional education for students and young professionals;
- Preparation for profession, open to society: Collaboration with new partners (industry, public and private organisations) and scientific mediation to the civil society.

The board members also raised the issue of the sustainability of IRIXYS. Currently, every university member must seek out funding (for administrative staff and projects) separately for short periods of time (yearly, or less). The team is going toward a more centralised organisation with less local management and more coordination within the partnership with funding pot and dedicated administrative staff. By updating its offer and added value, the team wished to get more sustainable funding.
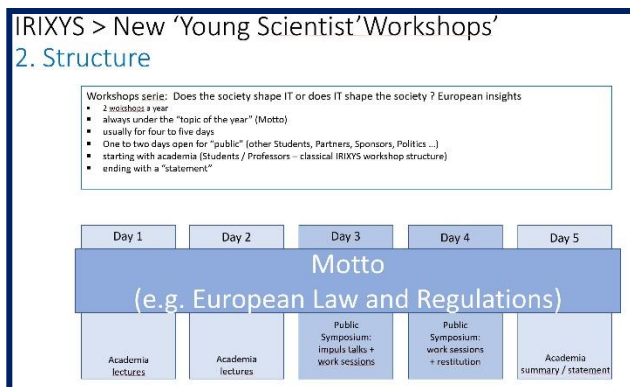
In order to do so, the team is undertaking a new Workshop format:

What's new? The basics of the IRIXYS Workshops remain the same (PhD talks and exchanges with supervisors). But we add a societal dimension of the workshops, one week dedicated to a hot topic with 1 day or 2 half-days with a symposium open to the public**.**

9

Main thread: Does the society shape IT or does IT shape the society? European insights

Principle: What are the impacts, challenges and opportunities of digitalisation in our European society? New technologies related to digital transition are developing at a rapid pace and are quickly becoming integrated into the daily lives of citizens. On one hand, civil society does not have the time to fully grasp these technologies, and scientific popularization is insufficient, leading to a lack of understanding, fascination, and mistrust among the general public. On the other hand, the race for innovation, competitiveness, and the pressure faced by governments and scientists demand careful attention and regulation, so that the digital transition truly serves our societies.

In this context, starting in 2024, the IRIXYS consortium will establish a series of workshops for a broader audience. Both scientific topics (AI, cybersecurity, health, etc.) and ethical, societal, legal, and sustainable issues will be addressed. The aim of these workshops is to facilitate a cross-disciplinary and multidisciplinary dialogue and act as a mediator between science and society.
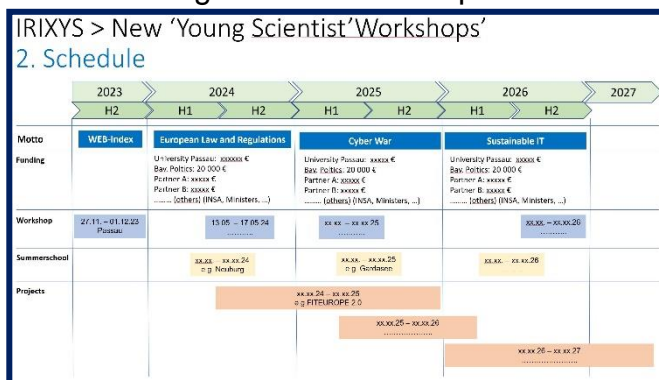

Format: 1 day or 2 half-days. Hands-on approach (FIT-Euope-like) with

- impulse talks;

- topics introduction and work sessions;

- restitution session and closing

Targets: PhD and master students of the consortium HEIs (not only from IT faculties)+ expert researchers/research insitutes, political representants, Social-economic players.

Certification: The public part of the workshops are integrated, meaning, they follow each other up and are part of a serie. We advertise them as a „curriculum". We aim at targeting commited students that participate to (at least) 2 workshops (~ 1 year). We will deliver a participation certificate (FIT Europe-like) listing the hard and soft skills acquired and possibly deliver ECTS. The workshops can be made mandatory for double-degree students and part of the IRIXYS PhD curriculum.

https://irixys.uni-passau.de

➢ *Other scientific results and awards*

Scholarships from the German-French University (DFH/UFA) were awarded to three Passau students.

As part of the celebrations for the 60th anniversary of the Elysée Treaty, the DFH/UFA honoured outstanding young scientists in binational and trinational programs on January 26th 2023 in Berlin and on November 24th 2023 in Strasbourg. For their excellent academic achievements, Amina Ben Salem, Alexis Strappazzon and Maud Andruszak, three PhD Track students, were awarded the "BNP Paribas-DFH Scholarship" with a value of 3000 euros.

The member of IRIXYS participated in several scientific publications, here a sample of the list for 2023:

- Schubert C., Fekih Hassen W., Poisl B., Seitz S., Schubert J,. Oyarbide Usabiaga E., Molina Gaudo P., Pettinger K.
  Hybrid Energy Storage Systems Based on Redox-Flow Batteries: Recent Developments, Challenges, and Future Perspectives
  Batteries 2023, 9(4), 211 [LINK]
- Felix Bölz; Diana Nurbakova; Sylvie Calabretto; Armin Gerl, Lionel Brunie & Harald Kosch. (2023): **HUMMUS: A Linked, Healthiness-Aware, User-centered and Argument-Enabling Recipe Data Set for Recommendation.** In Proceedings of the 17th ACM Conference on

Recommender Systems (RecSys '23). Association for Computing Machinery, New York, NY, USA, 1–11. [LINK]

- Sebastian Wilhelm; Dietmar Jakob; Armin Gerl & Sascha Schiegg. (2023): **Die Vision eines Personal Information Management-System (PIMS) durch automatisierte Datenschutzselbstauskunft.** In: Daten-Fairness in einer globalisierten Welt. S. 373-398. [LINK]

- Omar Hasan; Lionel Brunie & Elisa Bertino (2023): **Privacy-Preserving Reputation Systems Based on Blockchain and Other Cryptographic Building Blocks: A Survey**. ACM Computing Surveys, vol. 55, n°2, pp. 1-37. [LINK]

- Sophie Cerf; Bogdan Robu; Nicolas Marchand & Sara Bouchenak (2023): **Privacy protection control for mobile apps users.** Control Engineering Practice, vol. 134, May, p. 105456. [LINK]

- Wisnu Uriawan; Youakim Badr; Omar Hasan & Lionel Brunie (2023): **Decentralized trustworthiness score management with smart contracts on the trustlend platform.** IET Blockchain. [LINK]

- Brandon Mosqueda González; Omar Hasan; Wisnu Uriawan; Youakim Badr & Lionel Brunie (2023): **Secure and efficient decentralized machine learning through group-based model aggregation.** Cluster Computing. [LINK]

- Ousmane Touat & Sara Bouchenak (2023): **Towards Robust and Bias-free Federated Learning.** 3rd Workshop on Machine Learning and Systems (EuroMLSys '23), 8 mai 2023, Rome (Italie), pp. 49-55. [LINK]

- Pierre-Yves Genest; Pierre-Edouard Portier; Elöd Egyed-Zsigmond & Martino Lovisetto (2023): **Linked-DocRED – Enhancing DocRED with Entity-Linking to Evaluate End-To-End Document-Level Information Extraction.** SIGIR '23: The 46th International ACM SIGIR Conference on Research and Development in Information Retrieval, 23 juillet 2023, Taipei (Taïwan), pp. 3064-3074. [LINK]

- Diana Nurbakova; Audrey Serna; Abdelbasset Omiri & Antoine Boutet (2023): **Adaptive and Privacy-Aware Persuasive Strategies to Promote Healthy Eating Habits: Position Paper.** UMAP 2023 – 31st ACM Conference on User Modeling, Adaptation and Personalization, 29 juin 2023, Limassol (Chypre), pp. 129-131. [LINK]

- Diana Nurbakova; Felix Bölz; Audrey Serna & Jean Brignone (2023): **Towards Adaptive and Personalised Recommendation for Healthy Food Promotion.** [LINK]

- Chung-Chi Chen; Chin-Yi Lin; Chr-Jr Chiu; Hen-Hsen Huang; Alaa Alhamzeh; Yu-Lieh Huang; Hiroya Takamura; Hsin-Hsi Chen & Jun Zhao (2023): **Overview of the NTCIR-17 FinArg-1 Task: Fine-Grained Argument Understanding in Financial Analysis**. NTCIR 17 Conference: Proceedings of the 17th NTCIR Conference on Evaluation of Information Access Technologies, Tokyo, Japan [LINK]

- Alaa Alhamzeh (2023): **Financial Argument Quality Assessment in Earnings Conference Calls.** In: Strauss, C., Amagasa, T., Kotsis, G., Tjoa,

12

A.M., Khalil, I. (eds) Database and Expert Systems Applications. DEXA 2023. Lecture Notes in Computer Science, vol 14147. Springer, Cham. [LINK]

- Alaa Alhamzeh (2023): **Language Reasoning by means of Argument Mining and Argument Quality**. Doctoral Thesis. [LINK]
- Sascha Schiegg; Armin Gerl & Harald Kosch (2023): **Technische Aspekte eines Privatsphäre-beachtenden Datenaustauschnetzwerks**. In „Data Sharing: Datenkapitalismus by Default?", S. 5 [LINK]
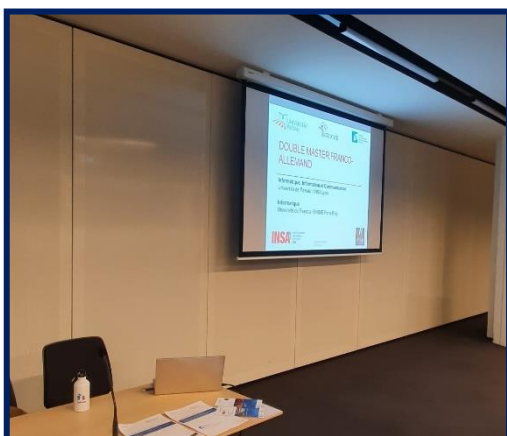
2. Policy and Industry Collaborations

2.1 UFA/DFH German-French University:

The German-French University (UFA/DFH) organises every year a German-French Forum in Strasbourg in which higher education institutions present their study programs in general as well as French-German and trilingual courses; public institutions inform visitors about their activities and funding opportunities; and companies have the chance to introduce their personal work policy and business activity as well as to recruit international orientated and high qualified interns and young professionals.

On November 24th and 25th, the German-French Forum could be organised on site in Strasbourg. It was a cheerful and fruitful event and IRIXYS could be represented alongside the university of Passau. Our French-German Volunteer presented our PhD-track and could explain to the younger generation the intercultural gain of such a binational program.

13

The UFA/DFH released a special call for project in 2023, in the frame of the 60 years of the Elysée-Treaty, symbolising the German-French friendship and collaboration. The University of Passau answered the call and successfully submitted a project. Because of its European significance, the funded project (German-French Hackathon/Data Challenge) will be further presented in the section 2.2
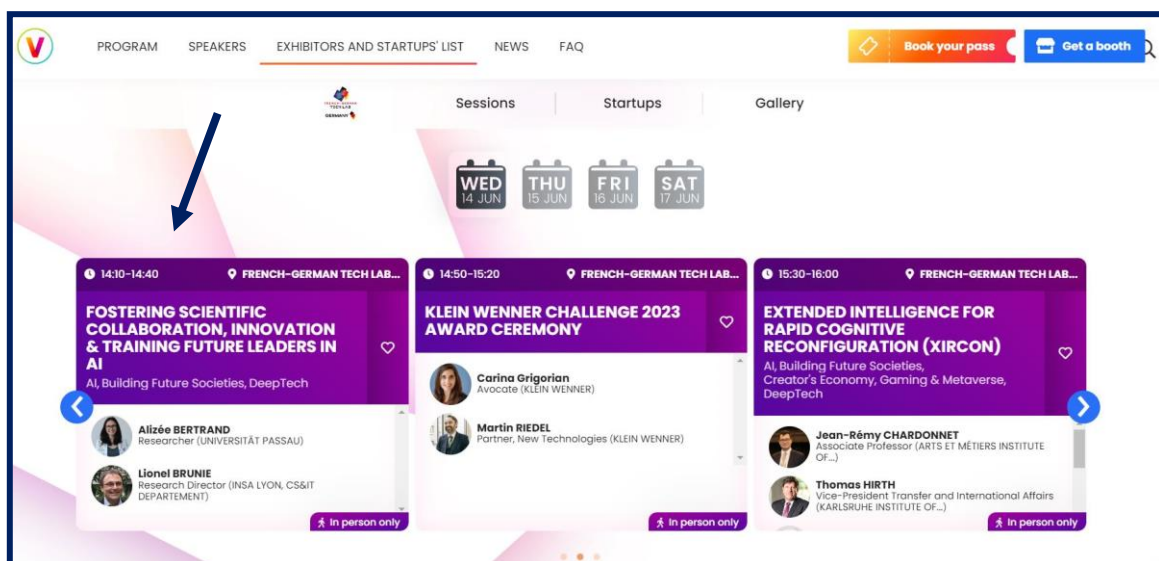

The UFA/DFH Programme Officer Meeting and Assembly of Member Universities 2023 took place in Potsdam on May 25th and 26th. The University of Passau and INSA Lyon jointly participated. At this occasion, the participants could exchange about their respective programs, the challenges they are currently facing and how to address them together.

2.2 French Diplomacy and European Collaboration

➢ *Participation at the yearly seminar of Fischbachau:*

Prof. Dr. Harald Kosch participated to the 55th German-French Seminar for Officials of the Bavarian institutions in Fischbachau. He participated to the panel of experts on January 19th about "France and Bavaria: partners in technology, innovation and entrepreneurship", focusing on the digital challenge.

➢ *IRIXYS at the Viva Technology fair in Paris 2023*

IRIXYS members (from UP and from INSA Lyon) participated to the Europe biggest convention on technology and innovation for industry and start-up, Vivatech, under the French-German Tech Lab. The team held a presentation on June 14th about the long-standing Bavarian-French cooperation and gave practical insights on how to foster scientific collaboration, innovation and how to train future leaders in AI. Furthermore, the IRIXYS team was joined by the startup INQEE, winner of the Bavarian-French AI Cup 2022. They presented their innovative AI-applied solution for PR and communication on the French-German stand.

https://irixys.uni-passau.de

> ➢ *Day of Scientific Communication: German-French Hackathon and Data Challenge in Passau*

The week of the Young Scientists' Workshop in December also provided the framework for the event organised as part of the DFH/UFA call for proposals on the 60th anniversary of the Élysée Treaty, on November 28th and 29th. German-French relations shape and impact the dynamics and design of Europe. In this sense, the event contained a strong European dimension. The aim was to intensify the relationship between science and European civil society. A hackathon (an event where interdisciplinary talents from different fields come together to develop innovative and sometimes unusual solutions to real and relevant problems from industry/research/economy) coupled with a data challenge - and the communication of the results – were successfully implemented. The main topic was the promotion of Europe's independence in web indexing, archiving and search. The challenge of Open Science and Open Web, as part of the quest for European digital sovereignty, is a highly relevant topic for the University of Passau and INSA Lyon, on which we exchange with our academic, industrial and political partners. The event targeted students and doctoral candidates from the partner universities (from Bavaria, France, Italy, Austria and Netherland), experts from industry and German-French diplomats.

After an introduction to the tasks, participants were invited to choose between a Data Challenge on Web Spam Detection and a Hackathon focused on creating their own original conversational search engine. The afternoon was dedicated to solving the problems in a focused atmosphere and ended with a well-deserved pizza evening and working session. On the following day, after the morning work-session, the official award ceremony took place at the university. We had the privilege of welcoming representatives from the political and scientific spheres, such as the French Consul in Munich, Corinne Pereira; the president of the university, Prof. Dr. Ulrich Bartosch; the scientific counselor from the French Embassy, Siegfried Martin-Diaz, and the CEO of ATOS Germany, Roland Wossidlo. Thanks to this event,

participants had the chance to present their results and connect with experts from both the academic and industrial worlds. The results were largely shared and also integrated into the Open Web Search project. The day ended with a typical Bavarian activity, a snowy walk to the Passau "Christkindlmarkt".
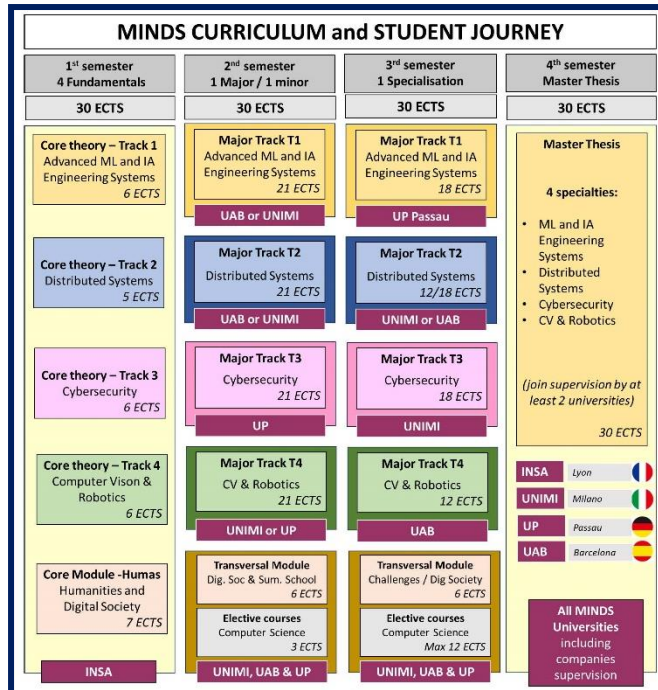

➢ *Other collaborations*

Master MINDS:

The university of Passau and INSA Lyon, in cooperation with the University of Milan and the Autonomous University of Barcelona, are working to develop an international master's degree of excellence in AI funded by the Erasmus + "Joint Master Erasmus

17

Mundus" (EMJM) programme. The Master INtelligent systems for a sustainable Digital transformation of the Society (Master MINDS) aims to provide students with strategic and technical knowledge and skills in the key areas of computer vision and robotics, cybersecurity, distributed systems, AI engineering, in order to become active players in digital transformation and innovation in public and private organisations.

In 2023, the staff focused on the implementation of the new Master and the Erasmus+ proposal to get the funding for the EMJM.
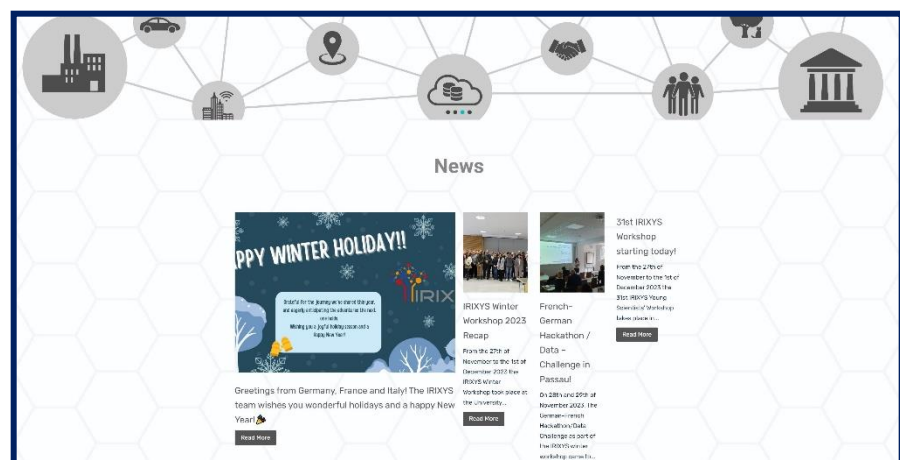

Reform-EUN-project

Together with ten universities from nine nations (among them INSA Lyon and ENSIIE Paris-Evry) and four European regions, the University of Passau has joined forces in a European University Network (EUN) entitled 'REform: Responsible Innovation & Ethics for Europe'. The very young consortium, which the University of Passau is leading with the Science Hub for Europe (SHE) as project manager, has bundled its work in 2023 in order to submit an application for the 2024 Erasmus+ European University Alliance Call. The consortium is united by a common vision for higher education in Europe: the development of an ethical educational space that will enable future European generations to tackle global challenges together and to act ethically and responsibly in the development of innovations with great potential for social transformation. This vision is based on the Responsible Research and Innovation approach, which links the excellence of universities to the assumption of social responsibility.

Every September, and during 10 months, the IRIXYS team welcomes a **French Volunteer from the "Deutsch-Französisches Jugendwerk"** (DFJW/OFAJ). This programme has been going on since more than 10 years and Passau welcomed 6 generations of young French volunteers, giving them an overview of the French and European cooperation within the chair of Prof. Kosch with hands-on activities. In 2023 the tasks attributed to the volunteers mainly focused on communication (intern and extern), web redaction and event planning support.

3. Communication

3.1 IRIXYS Website

In 2023 we continued the update initiated in 2022. Furthermore we are monthly monitoring the website, in order to maximize our range and adapt the frequency and content of our posts.

https://irixys.uni-passau.de

3.2 Other communication channels

The IRIXYS X (Twitter) account is useful and active to spread and share short news and give snapshots of ongoing events. Unfortunately, since the end of 2023, we have been facing issues with the account login and we are currently trying to fix them.

https://twitter.com/irixys

https://irixys.uni-passau.de

IRIXYS is also present on the social network LinkedIN and started communication activities in 2022. We developed our presence on LinkedIN in the year 2023 and successfully promoted scientific events and networking. Unfortunately, since the end of 2023, we have been facing issues with the account login and we are currently trying to fix them.

https://www.linkedin.com/in/irixys-research-center-889654199/

3.3 Picture credits

- **Copyright Universität Passau** all pages
- **Copyright DFH/UFA** page 11