



**Activity Report 2021** 

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.). Thirdly, IRIXYS relies on top joint research currently being carried out in the fields of big data analytics, artificial intelligence and IT security.

The purpose of this document is to report on all activities undertaken in 2021 by and in cooperation with IRIXYS and to assess to which extent this ambition has been fulfilled. The year 2021 was also shaped by the global pandemic. Nonetheless, thanks to the strong commitment of its members, IRIXYS managed to adopt innovative approaches to face the challenges inherent to the sanitary crisis. The planned activities were creatively and successfully organised in digital and hybrid format.

The IRIXYS cooperation accelerated in 2021, especially around its Franco-German axis and the very strong and smooth collaboration between INSA Lyon and the University of Passau. Despite the COVID-19 pandemic, collaboration between researchers was very well maintained, three workshop editions for young researchers could take place remotely and in presence. In addition, a new doctoral student at INSA Lyon/University of Passau started his cotutelle dissertation, both universities applied for joint Franco-German research projects and the French-German double master programs saw new arrivals of students. Since 2019, IRIXYS has also been involved in an EU strategic partnership. In the project, an innovative and joint curriculum is implemented to train "future IT leaders in a multicultural Europe" (Fit Europe project). Finally, IRIXYS reinforced its participation in various European and international initiatives.

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# 1. Academic and Scientific Collaboration

1.1. Consolidation of our academic collaboration

#### > IRIXYS PhD Track

The "IRIXYS PhD Track" was conceived to stimulate a bi-national academic postgraduate path: from the start of a Master to potentially achieving a PhD. In 2021, many students have either undertaken a double Master, or a PhD under French-German or French-Italian double supervision in the frame of IRIXYS.

In 2021, despite the difficulties and obstacles linked to the global pandemic which strongly affected students' mobility, 15 students from INSA Lyon and from the University of Passau could come to Passau to pursuit their studies in March 2021. Seven completed their Masters in Passau, while the eight others decided to stay one more semester to fully maximise their experience in Germany. In September 2021 four students of the University of Passau started a PhD Track and begun their studies at INSA Lyon.

Despite the pandemic, the specific course dedicated to the double-Master students on "working as an IT manager in France, Germany/Bavaria" took place remotely. It maintained a link with the French students who joined the university of Passau as the city was deeply impacted by the Corona measures (campus closed, shops closed, etc.) and enabled not only the social contact to be maintained, but also a real group spirit to be formed. In Summer, as the students could again go out, it was precious to meet in real for social activities.

#### Cotutelle de thèse

In 2021, the Chair of Distributed Information Systems of the University of Passau counted four students in cotutelle de thèse (PhD in supervision) with INSA Lyon: Alaah Alhamzeh, Ashish Ashutosh, Paul Lachat and Felix Bölz.

One student, Felix Bölz, began his cotutelle de thèse this year . Felix research topic focuses on Explainable and Privacy-preserving Recommendation. He started his research at the University of Passau where he could work with the DIMIS Lab (Distributed Multimedia Information Systems) at the chair of Distributed Information Systems and he will move to Lyon in April 2022 to be integrated to the LIRIS Lab (Laboratoire d'InfoRmatique en Images et Systèmes d'information) at INSA Lyon.

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

The academic cooperation between the University of Passau and ENSIIE Paris/Evry celebrates its first student exchanges this academic year (2021/2022). One student from the University of Passau started his master degree in Evry (Paris) in the winter semester 2021 and two students from ENSIIE will come in Passau for the summer semester 2022.

In 2021 the students of the double-Master in ENSIIE Paris made a videogame promoting the double master. This is a great way for the students to put in praxis their knowledge acquired during the studies, through a fun, nonconventional and efficient

promotion tool.



The videogame is accessible here: <a href="https://www.ensiie.fr/jeu-video-promotionnel-partenariat-ensiie-universite-de-passau/">https://www.ensiie.fr/jeu-video-promotionnel-partenariat-ensiie-universite-de-passau/</a>

#### 1.2. Consolidation of our scientific collaboration

➤ IRIXYS Digital Young Scientists' Winter Workshop (Milan)
18<sup>th</sup> and 20<sup>th</sup> of January 2021

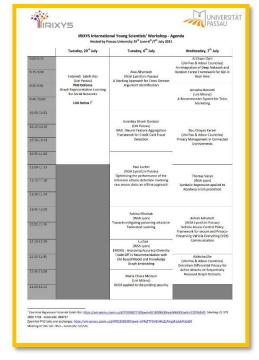
The IRIXYS Young Scientists' Workshop hosted by the University of Milano, in which some 25 students and professors from INSA Lyon, University of Passau, University of Milan and University of Pau participated, took place remotely. This two-day-online-Workshop was opportunity for the PhD students, despite the ongoing sanitary crisis, to share and exchange their latest findings with other young scientists, professors and senior researchers from the three IRIXYS countries. A plurality of specific research focuses were dealt with. from "A recommendation system for telco marketing" to "Detecting inference attacks involving raw sensor data".





# ➤ IRIXYS Digital Young Scientists' Winter Workshop (Passau) 29<sup>th</sup> of June and 6<sup>th</sup> and 7<sup>th</sup> of July 2021

The IRIXYS Young Scientists' Workshop hosted by the University of Passau, in which some 30 students and professors from INSA Lyon, University of Passau, University of Milan and University of Pau participated, took place remotely. During this three-day-online-Workshop the PhD students presented their research in order to receive feedback and to exchange ideas and thoughts among each other.



## > IRIXYS Young Scientists' Winter Workshop (Lyon)

#### 29th of November and the 3rd of December

The IRIXYS Young Scientists' Workshop hosted by the INSA Lyon took place in presence. Since the sanitary crisis, this Workshop has been the first event organised in hybrid format. 43 students and professors from INSA Lyon, University of Passau, University of Milan and University of Pau participated to this one-week-Workshop. Most of the PhD students could finally meet in person, present their research, their findings and interact with the professors and among themselves. It was a great success in term of scientific exchange and organisation, thanks to the very strict hygiene concept, we could enjoy a safe event.



Furthermore, this Workshop was the opportunity to invite and gather the IRIXYS Alumni (former PhD-track students and/or PhD students) for one day (in Hybrid format). Alumni from all over the world attended the Workshop on Thursday to catch up and to get in touch with the current IRIXYS PhD students. It was fascinating to listen to the Alumni providing an insight into their many different career paths in the field of informatics.



#### Other scientific results and awards

The member of IRIXYS participated in several scientific publications, here a sample of the list for 2021:

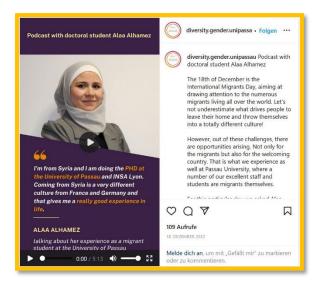
- Liana Ermakova, Patrice Bellot, Pavel Braslavski, Jaap Kamps, Josiane Mothe, Diana Nurbakova, IrinaOvchinnikova & Eric Sanjuan: Text Simplification for Scientific Information Access. 43rd edition of the annual BCS-IRSG European Conference on Information Retrieval: Advances in Information Retrieval (ECIR 2021), 1 avril 2021, Lucca (virtual) (Italie). [PDF]
- Diana Nurbakova, Lu Gan. Léa Laporte Sylvie Calabretto Recommandation diversifiée via des processus ponctuels déterminantaux sur des graphes de connaissances. Extraction et Gestion des connaissances, {EGC} 2021, 25 janvier 2021, Montpellier (France). [PDF]
- Liana Ermakova, Diana Nurbakova & Irina Ovchinnikova: Opposition politique et polarisation de groupe dans la discussion des traitements de la Covid-19 sur Twitter. Extraction et Gestion des connaissances EGC 2021, 25 janvier 2021, Montpellier (France). [PDF]
- Diana Nurbakova, Liana Ermakova & Irina Ovchinnikova: Understanding the Personality of Contributors to Information Cascades in Social Media in Response to the COVID-19 Pandemic. HAL: hal-03122001. [PDF]

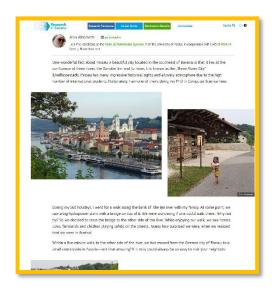
- Diana Nurbakova, Sylvie Calabretto, Timothée Saumet & Jialiang Wei :
   Extraction de signaux comportementaux d'utilisateur et prédiction de conclusion de vente. Extraction et Gestion des connaissances, {EGC} 2021, 25 janvier 2021, Montpellier (France). Poster. [PDF]
- Alaa Alhamzeh, Mohamed Bouhaouel, E.Egyed-Zsigmond, , J.Mitrovic, L.Brunie, and H.Kosch. A Stacking Approach for Cross-Domain Argument Identification. In DEXA 2021- The 32nd International Conference on Database and Expert Systems Applications. [BOOK]
- Alaa Alhamzeh, Saptarshi Mukhopadhaya, Salim Hafid, Alexandre Bremard, Elod Egyed-Zsigmond, Harald Kosch, and Lionel Brunie. A Hybrid Approach for Stock Market Prediction Using Financial News and Stocktwits. In CLEF 2021-Conference and Labs of the Evaluation. [BOOK]
- Alaa Alhamzeh, Mohamed Bouhaouel, E.Egyed-Zsigmond, J.Mitrovic.
   DistilBERT-based Argumentation Retrieval for Answering Comparative
   Questions Notebook for the Touché Lab on Argument Retrieval at CLEF 2021.
   [PDF]

More information on the LIRIS website: https://liris.cnrs.fr/en/team/drim

**Alaa Alhamzeh**, current PhD student in cotutelle de thèse, was also interviewed for a podcast campaign supporting gender diversity at the University of Passau: <a href="https://www.instagram.com/p/CI77OOIBS6x/">https://www.instagram.com/p/CI77OOIBS6x/</a>

She was also interviewed by the online blog Research in Bavaria, for an extensive article on "My New Life in Bavaria – A blog by international researchers": <a href="https://www.research-in-bavaria.de/de/bavaria-germany-a-destination-for-researchers/my-new-life-in-bavaria">https://www.research-in-bavaria.de/de/bavaria-germany-a-destination-for-researchers/my-new-life-in-bavaria</a>





In cooperation with various sponsors and supporters, the University of Passau awards the best dissertations submitted each year<sup>1</sup>. The prerequisite for admission to the selection process for the prize is usually a "summa cum laude" rating for the dissertation. The prizes are endowed with 3,000 Euros. The prize money is intended not only to honour the research achievements of the young academics, but also to provide



funds to deepen the research begun in the thesis. In 2021 **Dr. Benjamin Planche**, graduate of the Double Master's Degree in Computer Science between INSA Lyon and the University of Passau, who then undertook a PhD at the University of Passau together with SIEMENS, was awarded the Dissertation Prize of Sparda-Bank Ostbayern eG for his dissertation: "Bridging the Realism Gap for CAD-Based Visual Recognition".

# 2. Industry and Policy Collaborations

## 2.1 UFA/DFH German-French University:

The German-French University organises every year a German-French Forum in Strasbourg in which higher education institutions present their study programs in general as well as franco-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. This years two events took place.

A virtual info-day for German-French studies during which IRIXYS was represented, was organised on January, 13<sup>th</sup>. Thanks to this special format (online) we could invite Alumni of our PhD-track (disseminated all over the world) to talk about their experience and promote the program to younger students.

On November 12<sup>th</sup> and 13<sup>th</sup>, 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-

<sup>&</sup>lt;sup>1</sup> Dissertationspreis der Universität Passau: <a href="https://www.uni-passau.de/forschung/wissenschaftspreise/dissertationspreise">https://www.uni-passau.de/forschung/wissenschaftspreise/dissertationspreise</a>

track and could explain the younger generation the intercultural gain of such a binational program.





### 2.3 French Diplomacy and European Policy

# Utopie Europa:

In March, IRIXYS and especially the University of Passau participated to the Utopie Europa competition. This initiative was launched by the Institut français, the French-German University, in cooperation with the European Parliament Liaison Office in Germany and the European Commission Representation in Germany. The aim of Utopie Europa is to encourage students from German Universities to think about the future Europe they want to live in: students are expected to collectively discuss challenges faced by Europe and design solutions to be put forward in Brussels. The theme of 2021 focused on "Digital Europe".

Utopie Europa consists, on the one hand, in local debates in German Universities, and on the other hand, one big national-scale competition in which chosen students from

the participating institutions virtually gathered to present their proposal.

In this context, the University of Passau decided to take part in the competition and to embark the IRIXYS students' community in it. As a consequence, on the 2nd March, we organised an exchange between Philipp



Slussallek (scientific Director of the German Research Center for Artificial Intelligence DFKI) and 80 students and professors from the University of Passau, INSA Lyon and the University of Milano, about the ethical issues raised by Big Data.

On March, 22<sup>nd</sup>, the four students representing the University of Passau, Niklas Beierl (Uni Passau), Kseniia Vasylieva (Uni Passau), Manuel Lehner (Uni Passau), and Corentin Laharotte (INSA Lyon, France) defended their project dealing with the problematic "Should Data rule Tomorrow's Europe" at the final virtual debate in Berlin. Reflecting on the initiative, "It's nice to be heard," emphasized Niklas Beierl, adding: "while discussing with politicians and competing with students in law, we discovered that we, students in computer science, are not sufficiently provided with the necessary skills to make us understandable by others, who are not familiar with computer science. This is something where our University could maybe further reflect?"





### Visit of the French Ambassy Delegation:

On June 29<sup>th</sup>, the French Ambassy Delegation represented by Pascal Revel, Scientific Advisor and Head of research Department, and Hervé Martin, Attaché for Science and Higher Education, visited the University of Passau to exchange on French-Bavarian cooperation on AI and Big Data. On this occasion, the chair of Distributed Information Systems presented its French-Bavarian projects (the AI Cup Challenge and FIT Europe) and the French Delegation had the opportunity to talk with our current PhD students in Cotutelle de thèse and hear about their experience.



#### > French National Day:

On July 14<sup>th</sup> the Chair of Distributed Information Systems and particularly our IRIXYS students and OFAJ volunteer celebrated the French National Day. French flags and

patisserie brightened the day!



#### Participation in GAIA-X

The German Federal Ministry for Economic Affairs and Energy (BMWi) launched the GAIA-X initiative in 2019. The aim is to reduce dependence on American and Chinese IT providers and data-driven platforms. In the meantime, the project has got off to such a successful start that it is supported by several European states and companies worldwide.

The University of Passau joined the GAIA-X initiative in September 2021.

## > FIT Europe

Since 2019 IRIXYS has been involved in the Erasmus + project FIT Europe (2019-2022): <a href="https://fit-europe.eu">https://fit-europe.eu</a>

The digitalization of society offers an unlimited field for innovation, and, with the support of information and communication technologies (ICT), we are transitioning towards a rapidly evolving context of novel, unexpected technological, societal, and industrial challenges. One of these is the employability of IT graduates, a challenge in the context of a rapidly evolving environment featuring novel technologies. The European leading partners comprises four leading Universities and four corporate partners from France, Germany, Italy and Romania.

FIT Europe aims to create a platform which enables the industrial and academic participants to develop methods and practices, analyse social and/or economic impacts of emerging technologies and to produce new knowledge on how IT can contribute to boundary-breaking innovations that will enable ambitious development

and growth in intelligent socio-technical futures, all of which combine to realise the goal of educating "Future IT leaders for a Multicultural, Digital Europe".

The project organizes four seminars with international students. Three out of four have already taken place in 2021. The general structure of the one-week seminars were as follow: On the one hand, preeminent experts from all Europe (Scientists from academia and technological experts from companies) were invited to talk about their findings and exchange with the students. On the other hand, the students, divided in international teams, were given use-cases challenges by a socio-economic partner to work on during the week. At the end of the seminars, a jury of experts was gathered, and a ceremony was organized to award the team that presented the most promising project work.

Two seminars took place remotely (seminar of Passau and seminar of Lyon), but the digital format enabled to gather participants from all over Europe despite the ongoing pandemic, and digital tools, such as Wonder, created an atmosphere conducive to fruitful exchanges and group work (e. g. fireside chat, digital cosy living-room). The participants, experts and students, could really bound, and this laid the ground for the third seminar on site in Milan, for which a trustful environment was already created.



In order to gather and disseminate the outputs and outcomes of the seminars, a multimedia library was put together: <a href="https://library.fit-europe.eu/">https://library.fit-europe.eu/</a>

# 1. FIT Europe online Seminar of Passau from February 22<sup>nd</sup> to February 26<sup>th</sup> on Big data and its ethical/societal implications<sup>2</sup>

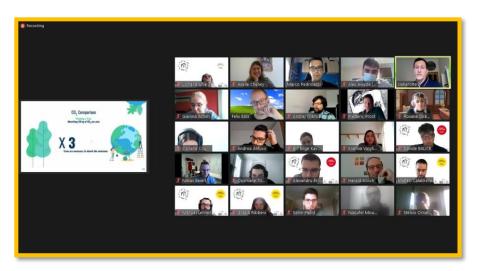
43 participants attended the online seminar organised by the University of Passau. The students and experts focused on and exchanged ideas about the topic "Should big data rule tomorrow's world".

As the development of data will be a future issue affecting not only the field of the technological development of artificial intelligence and computer science, but the whole society, the Passau seminar was built so as to provide students not only with

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<sup>&</sup>lt;sup>2</sup> https://library.fit-europe.eu/course/view.php?id=2

technological skills related to the latest innovations in artificial intelligence and big data, but also with "soft skills", through the inputs provided by experts in law, in humanities as well as in human resources and the development of business strategies. It followed an innovative and interactive format that combined presentations including a real exchange and debate between students and experts. The project works in teams allowed the students to reflect on ethical, societal, and environmental issues raised by the main topic of the seminar. For instance, from the importance of the government's transparency in the use of big data; the improvement of healthcare and the danger of its application; to the monthly footprint for messaging applications and for miscellaneous web use. The teams were guided by "mentors" from academics and professionals.



# 2. Fit Europe online Seminar of Lyon from June 7<sup>th</sup> to June 11<sup>th</sup> on Blockchain and Innovation for digital society<sup>3</sup>

40 participants attended the online seminar organised by INSA Lyon. The students and experts focused on and exchanged ideas about the topic "Blockchain and innovation for a digital society".

Beside the master students from the four participating universities, the seminar gathered high level scientists from all Europe, technological experts from companies, all of them specialized in blockchain technology and experts of entrepreneurship ecosystems. Multiple hot topics were addressed in the domain of blockchain, from scientific topics to applications and business impact of blockchain technology, and finally to start-up creation. For the project works in teams, regional start-ups were involved and collaborated closely with the students, CEO, CTO and technology experts dedicated their time all week long to the students. The companies formalized challenges for the students raising issues they were actually facing and for which the teams were expected to bring a real added value.

<sup>3</sup> https://library.fit-europe.eu/course/view.php?id=3



# 3. Fit Europe Seminar Milan (in presence) from November 15<sup>th</sup> to November 19<sup>th</sup> on preserving privacy and trust in IoT<sup>4</sup>

35 participants attended the seminar in Milan organised by the University of Milan. It was the first seminar in presence since the outbreak of the pandemic. The students and experts focused on and exchanged ideas about the topic "Preserving Privacy and Trust in the Internet of Things".



As the digitalisation expends, IT privacy and security are highly relevant topics and their implications directly impact the end-users. The seminar, through lively and thought-provoking discussions, tackled issues such as ethics and regulations in IoT and robotics; transparency and privacy at home; or how software defines smart cities. The project works were supervised by the Italian company Engineering. They developed scenarios, derived from effective ongoing research projects, in which the students should identify the threats and try to come up with a solution. The challenges

<sup>&</sup>lt;sup>4</sup> https://library.fit-europe.eu/course/view.php?id=4

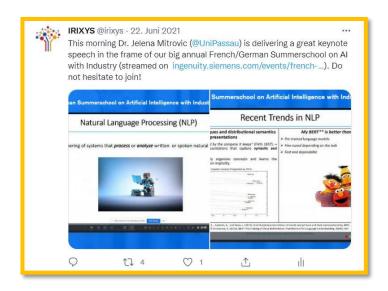
dealt, for instance, with federated machine learning in IoT or data privacy in the age of 5G for green vehicles.



## 2.3 Implications in Industry

French-German Summer School on Artificial Intelligence with industry

The fifth edition of the French-German Summer School on Artificial Intelligence with industry, organized by the University of Passau, Ecole Normale Supérieure Paris-Saclay and with the support from Siemens Al Lab, took place remotely on June 21<sup>st</sup> to 23<sup>rd</sup>.



The Summer School focused on a variety of topics high on our French and German scientific agendas, such as Trustworthiness of AI, Quantum Computing, Natural Language Processing, Reinforcement Learning, the use of AI and Data Science in small and middle-size Companies etc. The online Summer School was a success with no less than 100 participants and 10 keynote speakers.



#### Meeting with La French Tech Munich

La French Tech Munich was born in April 2021 to help entrepreneurs, investors & corporates scale across these two countries: by nurturing the innovation and tech ecosystems, we build bridges across the Rhine.

On September 16, the French General Consulate organised the event Munich meets La French Tech (Munich a rendez-vous avec la French Tech). This meeting enabled La French Tech to discuss its ambitious strategy foster the bilateral French-Bavarian cooperation on innovation and high technology and it was the occasion to meet the strong French-Bavarian university cooperation ecosystem. On this occasion, Prof. Harald Kosch introduced the newest French-Bavarian project in line with the French-Bavarian



Agenda on Innovation and high technology, the AI-Cup Challenge.

### 3. Communication

#### 3.1 IRIXYS Website

The website is regularly animated and updated by the members of IRIXYS (University of Passau) and student assistants (HiWis). It is a work in progress with a strong focus on the "News" section where articles about IRIXYS activities and related events are published.

IRIXYS Identity

The International Research & Innovation Centre on Digital Intelligent Systems gathers excellence in computer science research and academia from France, Cermany and Italy

https://irixys.uni-passau.de

#### 3.1 Other communication channels

The IRIXYS twitter account is very useful and active to spread and share short news and give snapshots of ongoing events.

https://twitter.com/irixys



IRIXYS is also present on the social network LinkedIN. We plan to set a focus on LinkedIN in the year 2022, to promote scientific events.

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