



Blended Intensive Program (BIP) 2025

Artificial Intelligence and Big Data shaping our World

21. January 2025 – v01

Arunas Lipnickas (KTU, Lithuania)

A. Program outline

Course Title:	Artificial Intelligence and Big Data shaping our World
Participating Institutions:	Kaunas University of Technology (Coordinator), Kaunas, Lithuania Polytechnic Institute of Maia, Maia, Portugal Duale Hochschule Baden-Württemberg, Karlsruhe, Germany Institut Polytechnique des Sciences Avancées, France Bialystok University of Technology, Poland
ECTS:	3
Date:	Summer 2025 Online phase starting 5.5.2025 with individually paced learning units Workshop: 7.-11.7.2024 at KTU, Studentų g. 48, Kaunas (GPS: 54.905690, 23.956308), Lithuania
Target Audience:	20-25 International Students with various backgrounds (not necessarily IT)
Lecturers:	6 (2 from each organization)
Workload hours:	75h total, split into: <ul style="list-style-type: none"> 4h online teaching 15h online guided team collaboration 17h autonomous work 34h in-person (at KTU) 5h Individual report

B. Content and details

Motivation:

Artificial intelligence (AI) and the intensive use of large available data (a.k.a. “big data”) offers a vast array of new business models and possibilities to optimize existing processes. This is not limited to the field technology or related areas: Traditional business fields, governments or individuals can use this technology as well, e.g. in order to diagnose machinery defects, estimate taxes or find ideal clothes when online-shopping.

This wide-scale application will result in a massive transformation of our society, since many existing jobs and businesses will become obsolete or at least change drastically, while at the same time, new opportunities emerge.

It is as such crucial, that students of all fields are exposed to this change early-on and reflect on the potential changes and limitations of AI and big data. At the same time, the global speed of adaptation varies due to cultural, legal or other circumstances (language,...), which makes it important to exchange experiences and perspectives internationally.

Aims and learning objectives:

After completion of the program, the students should ...

- ✓ ... have a more detailed understanding on the possible technological applications and limitations of AI and big data
- ✓ ... understand the transformational force of these trends, both on the business side, but also on our society as a whole
- ✓ ... develop a perspective on how our economy and the workforce will adapt to these changes and evaluate the consequences
- ✓ ... be aware of potential ethical conflicts and the danger of discrimination
- ✓ ... can point out secondary effects such as gaming of systems or change of implicit social norms

Course outline (detailed planning in Appendix) :

An overview of the course is given below, while a detailed description of the content and the precise times can be found in the appendix.

Date and Time	Mode and workload	Content
6.7.2025	<i>Suggested individual arrival</i>	
6.7.2025	On site	Evening welcome drinks at KTU/Kaunas
7.7.2025	In-person at KTU (8h)	Workshop day 1
8.7.2025	In-person, various locations (5h*)	Meeting company representatives. Campus tour. Off-site case study 1.
9.7.2025	In-person at KTU (8h)	Workshop day 2
10.7.2025	In-person, various locations (5h*)	Off-site case study 2 Kaunas guided tour
11.7.2025	In-person at KTU (8h)	Workshop day 3; Farewell dinner
12.7.2025	<i>Suggested individual departure**</i>	
13.7.-1.8.2025	individual work for writing report (5h)	Individual report Deadline 1.8.2025
30.9.2025	Final grading submitted to KTU and formal awarding of credits	

* Note: This is a joint social and learning program, so not the full duration was allocated as contribution to the credit-related hours.

** Note for coaches and academic staff: 12.7. would be suggested for individual meetings to discuss further collaboration

Teaching methods:

In order to maximize the learning experience and the positive effects of the intercultural learning environment, a strong emphasis is placed to minimize classical “frontal” teaching. This is mostly done during a short introductory lecture (4h). The students are then assigned international teams that should research a given topic (e.g., new business models) under the guidance of the lecturers and prepare together a compelling presentation on their topic.

These presentations will be held on-site during the workshop by the students and be the basis of further discussions with the other teams. To further broaden the experience, two local excursions are planned that should both enrich the cultural experience but also lead to a discussion regarding historical developments and potential future changes.

The course finishes with a report that reflects on the learnings and is to be published in a forum that again opens the space for discussion.

Assessment:

Credits will be assigned based on the graded group presentations (50%) as well as individual reports from students reflecting on their own learnings (50%).

Participants:

This course is open to students from various backgrounds, particularly non-IT fields. A total of around 30 students is planned; as of March 2025, the participant numbers are as follows:

12-18 students from DHBW Karlsruhe

5 students from Institut Polytechnique des sciences Avancées (IPSA)

5 students from Bialystok University of Technology

5 students from IPMAIA

Optional 6 students from KTU

Note that at least 20+ Students must be “international mobile” in person at KTU!

C. Benefits beyond course workload

This program offers a variety of benefits beyond the course workload, which include:

- ✓ Networking of students and lecturers for further possibilities for exchange and collaboration
- ✓ Exposure of students and lecturers to different cultures
- ✓ Strengthening the formal ties between the participating institutions
- ✓ Diverse learning experience for students both in terms of methods and content
- ✓ Teaching experience for the associated lecturers and coaches

D. Administrative details

On-site workshops:

All on-site workshops will be held at KTU, Faculty of Electrical and Electronics Engineering: Studentų g. 48, Kaunas, Lithuania (GPS: 54.905690, 23.956308).

Transportation:

Students are responsible for their own transportation to and from Kaunas as well as to and from KTU (Studentų g. 48, Kaunas).

Accommodation:

Students and lectures are free to book their own accommodation in Kaunas. Organizers of BIP2025 have negotiated with KTU accommodation facility to accept students for 100-120Eur payment during BIP week. *A priori* reservation will be needed.

Appendix

Appendix 1: Lecturers and topics

Appendix 2: Detailed course outline and times

Appendix 1: Lecturers and topics

Each lecturer is in charge of one topic and supervises a student team, who will prepare and ultimately present the topic at the workshop at IPMAIA.

Arūnas Lipnickas (KTU): How to protect Human Rights in the age of AI?

With the increasing use of artificial intelligence (AI), protecting human rights has become more challenging. However, there are steps we can take to ensure that AI is used ethically and responsibly. First, governments must establish clear guidelines and regulations to prevent the misuse of AI. Second, companies and organizations that develop and use AI must be transparent about how they collect and use data. Third, there should be an emphasis on ensuring that AI is used for the benefit of society as a whole, rather than for the benefit of a few individuals or groups. Finally, we must continue to educate and raise awareness about the potential risks and benefits of AI. By taking these steps, we can ensure that AI is used to protect, rather than infringe upon, human rights.

Célia Maria Martins Soares (IPMAIA): AI-Driven telling stories with data visualization

A workshop on AI-Driven telling stories with data visualization is a great way to learn how to communicate data insights effectively and efficiently. The workshop covers topics such as how to use data visualization tools to create compelling visualizations that tell a story with data. It could also cover how to use machine learning algorithms and natural language processing techniques to analyze large datasets and extract insights that can be used to tell a story with data.

Karsten Junge (DHBW): Ethical Challenges

A central characteristic of Artificial Intelligence (AI) is its capability to make decisions in complex situations. AI has therefore the capability to replace highly ranking human decision makers like business managers. Such AI systems could be a part of standard business software. Complex decisions, however, very often comprise an ethical dimension. Some examples:

Example 1): A highly profitable investment causes damage to the environment or uninformed people. A company wants to invest into a new production plant (e.g. Tesla Gigafactory in Grünheide/Berlin), which is highly welcomed by politicians and many stakeholders, because this investment creates a lot of jobs and makes many people rich. On the downside, the new plant causes a lot of damage to the environment, endangers rare species etc. Moreover, a lot of water is consumed by the new plant, which is taken from the ground, so that the neighbouring farms can no longer be maintained. Thus, the jobs and the lives of the farmers and the future of their families are destroyed. Should the new plant be built?

Example 2): A new fancy electric car sells very well thanks to its advantageous and extraordinary features, like a very low consumption of electrical energy and a special and inexpensive battery that allows to drive 2000 km without recharging. However, it turns out that the battery fails from time to time, so that it starts to burn rapidly and ignites the whole car, which turns into ashes in just a few minutes. Unfortunately, with the failure of the battery, the doors cannot be opened, so that the driver and passengers are facing a deadly fate in such an event. This event is very rare and occurs

only in one out of ten million sold cars within the first 6 months. Should the car be sold?

According to which ethical standards or values (value frameworks) could human decision makers find their decisions? Which value frameworks could be used for AI? How could an AI system be trained to be prepared for such decisions?

Vygandas Vaitkus (KTU): How AI machines learn

The process of how AI machines learn raises important philosophical questions about the nature of knowledge and intelligence. Some argue that machines cannot truly learn because they lack consciousness and self-awareness. However, others argue that the ability to learn and adapt is a fundamental aspect of intelligence, regardless of whether it is achieved through biological or artificial means. Furthermore, the process of machine learning raises questions about the role of humans in shaping the development of AI. As we continue to build machines that can learn, it is important to consider the ethical implications of creating machines that may eventually surpass human intelligence.

Luís Miguel Barbosa Proença (IPMAIA): Human and machine decision making in the age of Artificial Intelligence

The idea behind “Human and Machine Decision-Making in the Age of Artificial Intelligence” is to explore the dynamics between human intuition and decision-making processes and intuition and machine algorithms. As AI systems become increasingly prevalent, understanding the interplay between human judgment and automated decision-making is crucial. It provides an introduction into cognitive science and data analytics, examining how AI influences decision-making processes in various sectors, including healthcare, finance, with a particular interest in autonomous systems. The case studies highlight the strengths and limitations of AI, giving a perspective on when to trust machine-generated insights. Ethical considerations are also a focal point, for we should explore the moral implications of AI decisions. Students will be equipped with critical thinking skills and a framework for integrating AI tools into decision-making strategies, preparing them for the evolving landscape of AI-driven industries.

Torsten Harms (DHBW): New business models

Big Data and Artificial Intelligence will provide a form of “cheap” intelligence that opens new business models. For example, object recognition could be used to identify fashion items from photos and offer to shop them, or people could be connected on a platform based on similar travel locations in the past. At the same time, some other traditional business will become outdated, such as tour guides or translators and be (largely) replaced by machines. During their presentation, the students will illustrate such effects in the past and introduce the business model canvas as a model to structure such changes. This tool will also be used in a breakout session during the presentation in which the participants should discuss and present potential changes for each area of the business model canvas.

Appendix 2: Detailed course outline and times

AL: Arūnas Lipnickas (KTU)

CMMS: Célia Maria Martins Soares (IPMAIA)

KJ: Karsten Junge (DHBW)

VV: Vygandas Vaitkus (KTU)

LMP: Luís Miguel Barbosa Proença (IPMAIA)

TH: Torsten Harms (DHBW)

The initials stand for the responsible lecturer for this part (not necessarily the presenter):

All Times are Lithuanian time!!

Date and Time	Mode/workload	Content
05.5.- 15.5.2025 Individual study hours	Individual self study (2h)	Preparation Outline of course (TH) Pre-reading to AI and big Data (TH) (all via prior e-mail to participants) (TH)
15.5.2025 13:15-17:15	Online teaching (4h)	Introduction and assignment Introduction to AI and Big Data (AL) Differences and similarities to existing technological chances (KJ) Already existing implications on our society (LMP) How AI machines learn (20 min) (VV) Human and machine decision making (20 min) (LMP) AI-Driven telling stories (20 min) (CMMS) New business models (20 min) (TH) Ethical challenges (20 min) (KJ) Protection of human rights (20 min) (AL) Introduction to task and virtual collaboration (incl. tools for collaboration such as Meistertask) (VV) Questions and assignment of tasks (TH)
15.5-4.7.2025 individual dates and times	online guided team collaboration (15h); autonomous work (15h)	Virtual research and workshop preparation Group research (international teams of 3-5 persons) on one the assigned topic Objective: Preparation of a half-day workshop (incl. discussion) Each Team is supported by academic staff from the 3 institutions during their research phase: . How AI machines learn (VV) . Human and machine decision making (LMP) . AI-Driven telling stories (CMMS) . New business models (TH) . Ethical challenges (KJ) . Protection of human rights (AL)
6.7.2025	<i>Suggested individual arrival</i>	
6.7.2025 18:00-20:00	on site	Get-together Drinks At Studentų g. 48, Kaunas (GPS: 54.905690, 23.956308)
7.7.2025 9:00-13:00 14:00-18:00	In-person at KTU (8h)	Workshop day 1 Student-presented workshop and discussion of . How AI machines learn (4h) (VV) . Human and machine decision making (4h) (LMP)

8.7.2025 9:00-17:00	In-person, various locations (5h*)	Off-site case study 1 Example: Meeting company representatives. Campus tour.
9.7.2025 9:00-13:00 14:00-18:00	In-person at KTU (8h)	Workshop day 2 Student presentation and discussion of . AI-Driven telling stories (4h) (CMMS) . New business models (4h) (TH)
10.7.2025 9:00-17:00	In-person, various locations (5h*)	Off-site case study 2 Example: Kaunas guided tour
11.7.2024 9:00-13:00 14:00-18:00	In-person at KTU (8h)	Workshop day 3 Student presentation and discussion of . Ethical challenges (4h) (KJ) . Protection of human rights (4h) (AL) Wrap up of workshop (all) Farewell dinner (to be defined)
12.7.2025	<i>Suggested individual departure**</i>	
13.7.-1.8.2025 Individual dates and times	individual work for writing report (5h)	Individual Report Individual Report (2-3 pages), reflecting on the learnings during this program and transfer onto future applications and behaviour; Deadline 1.8.2025
30.9.2025	Final grading submitted to KTU and formal awarding of credits	

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