



Hotărârea nr. 187/21.09.2022

cu privire la aprobarea

**Raportului privind organizarea Școlii de vară „Data Science International
Workshop”, organizată în perioada 22-31.07.2022**

În temeiul Hotărârii Consiliului de Administrație nr. 404/02.08.2022 cu privire la înaintarea către Senatul ASE a propunerii de aprobare a raportului privind organizarea Școlii de vară „Data Science”, organizată în perioada 22-31.07.2022;

În conformitate cu prevederile art. 213 alin. 2 lit. n) din Legea nr. 1/2011 a educației naționale, modificată și completată, ale art. 38 pct. 36 din Carta ASE, ale art. 3 pct. 36 din Regulamentul de organizare și funcționare a Senatului ASE, precum și ale Hotărârii Senatului nr. 8/22.01.2020;

Senatul Academiei de Studii Economice din București

Hotărăște

Art. 1. Aprobarea Raportului privind organizarea Școlii de vară „Data Science International Workshop”, desfășurată în perioada 22 iulie – 31 iulie 2022, conform anexei care face parte integrantă din prezenta hotărâre.

Art. 2. Consiliul de Administrație va duce la îndeplinire prevederile prezentei hotărâri.

Președinte Senat,

Prof. univ. dr. Dumitru MIRON

Cancelar Senat,

Prof. univ. dr. Paul POCATILU

Avizat pentru legalitate,

Director Direcția Juridică și Contencios Administrativ

Consilier Juridic Elena GĂMAN



Academia de Studii Economice din București
Bucharest Business School (Școala de Afaceri)

Calea Griviței Nr. 2-2A, 010731
Sector 1, București, România
office@bbs.ase.ro, +4 (021) 312 97 24
<http://www.bbs.ase.ro>



Raport de activitate

Școala internațională de vară Data Science – ediția a 3-a

Școala internațională de vară Data Science s-a desfășurat în perioada 22 – 31.07.2022, la Centrul de Perfecționare Complex Predeal „Ion Gh. Roșca”.

Activitățile au fost o continuare a edițiilor anterioare și au fost coordonate de către conf. univ. dr. Vasile Alecsandru Strat, decan al Bucharest Business School. În cadrul acestei ediții activitățile școlii de vară s-a desfășurat în parteneriat cu Institutul GATE din cadrul Universității St Kliment Ohridski din Sofia și au fost sprijinite de mindit.io și de către Asociația GESA. De asemenea, acestea au beneficiat și de sprijin în cadrul proiectului FSS 1477/22.02.2022 finanțat de MEN.

PREAMBUL

Proiectul a continuat fructificarea relațiilor inter-universitare cu diaspora românească din SUA și Europa. De asemenea, proiectul a reprezentat a treia ediție a evenimentului care va continua și în anul 2022 și care va avea și alte direcții de dezvoltare în viitor. Proiectul a vizat dezvoltarea masteranzilor, doctoranzilor, tinerilor profesioniști și a unor cadre didactice de către specialiști de top în domeniul „data science”.

Domeniul este unul prioritar pentru universitatea noastră și pentru România și s-a urmărit acoperirea tuturor ariilor majore din cadrul data science printr-un program intensiv, care a combinat aspectele teoretice cu sesiuni aplicative, proiecte și prezentări inspiraționale.

PROGRAM

Derulat pe parcursul a 8 zile, programul de studiu a acoperit o varietate de aspecte esențiale ale data science: statistică, machine learning, rețele neurale, text mining, data management, data visualisation, aplicații financiare și economice ale data science. Toate activitățile s-au desfășurat în limba engleză, având în vedere participarea internațională extinsă, participanți și lectori din 6 țări.



Academia de Studii Economice din București
Bucharest Business School (Școala de Afaceri)

Calea Griviței Nr. 2-2A, 010731
Sector 1, București, România
office@bbs.ase.ro, +4 (021) 312 97 24
http://www.bbs.ase.ro



Participanții au beneficiat de câte șase ore de activități educaționale zilnic, în regim intensiv. Acestea au fost echitabil distribuite între activități de predare, activități aplicative de tip „hands-on”. De asemenea, participanții au realizat și prezentat proiecte în echipă și individuale. Programul activităților didactice și de lucru în echipă a acoperit 45 de ore, la care se adaugă activitățile de socializare (reuniunea și cina de bun-venit, evenimentul social, cina de la finalul programului).

Pe parcursul programului, participanții s-au familiarizat cu instrumente software utilizate în analiza datelor: Python, NumPy, SciPy, Matplotlib, nltk, Jupyter Notebook, Ipython, Pandas, Scikit-learn, Seaborn.

Anexăm prezentului raport programul complet al activităților (Anexa 1).

LECTORI

Lectorii recrutați pentru activitățile desfășurate sunt specialiști de top în domeniul data science, profesori și cercetători provenind de la universități și institute de prestigiu și activând în proiecte cu impact major:

- Dan Nicolae (University of Chicago, USA), Professor, PhD
- Razvan Bunescu (University of North Carolina at Charlotte, USA), Associate Professor, PhD
- Maryna Waszak (SINTEF AS, Norway), Research Scientist, PhD
- Carlos A. Iglesias (Universidad Politécnica de Madrid, Spain), Professor, PhD
- Gabriel Terejanu (University of North Carolina at Charlotte, USA), Associate Professor, PhD
- Dumitru Roman (SINTEF / University of Oslo, Norway), Senior Research Scientist / Associate Professor, PhD
- Vassil Vassilev (London Metropolitan University, UK and GATE Institute, Bulgaria), Professor in AI and Intelligent Systems, PhD
- Nikolay Nikolov (SINTEF AS, Norway), Research Scientist
- Wiktor Sowinski-Mydlarz (London Metropolitan University, UK and GATE Institute, Bulgaria), Senior Research Scientist, PhD
- Brian Elvæsæter (SINTEF AS, Norway), Research Scientist.

Detalii despre lectori se găsesc pe pagina web a evenimentului și pe paginile de LinkedIn ale acestora.



Academia de Studii Economice din București
Bucharest Business School (Școala de Afaceri)

Calea Griviței Nr. 2-2A, 010731
Sector 1, București, România
office@bbs.ase.ro, +4 (021) 312 97 24
http://www.bbs.ase.ro



PARTICIPANȚI

Proiectul a vizat dezvoltarea unei comunități de persoane cu competențe în zona de data science și de asemenea consolidarea conexiunilor cu mediul de afaceri. Dat fiind caracterul intensiv și foarte specializat al programului dar și necesitatea de a crește comunitatea de specialiști au fost selectați 38 de participanți care să aibă competențe ridicate în domenii ca algebră liniară, teoria probabilităților, statistică, econometrie, programare și reprezentare de date.

Candidaturile au fost depuse online, pe site-ul școlii de vară (www.datascience.ase.ro). Cei 37 (+ 5 organizatori) participanți au fost selectați, ținând cont de criteriile enumerate anterior și motivația acestora. Candidaturile au provenit din România, Bulgaria, Norvegia, Estonia, Portugalia, India, Fasia Gaza, și Nigeria.

Prin comunitatea creată pe parcursul școlii de vară, estimăm că impactul acesteia va depăși numărul participanților direcți prin includerea cunoștințelor și competențelor dobândite în teze de doctorat / proiecte de masterat, articole științifice și activități de analiză de date în companii care activează în România.

Directii de dezvoltare viitoare

Feedback-ul obținut de echipa de organizare atât din partea participanților cât și din partea lectorilor a fost unul pozitiv acestia menționând faptul că este evidentă creșterea evenimentului de la ediție la ediție. De asemenea, partenerul din Bulgaria, Institutul Gate și-a exprimat deschiderea pentru continuarea și extinderea colaborării.

Pentru identificarea punctelor forte și a celor care necesită îmbunătățiri în edițiile viitoare vor fi aplicate chestionare de feedback în perioada următoare.

Totuși, pe baza feedback-ului obținut de organizatori în discuțiile cu participanții a fost apreciată calitatea lectorilor și a subiectelor atinse, chiar dacă densitatea acestora, în timpul redus al școlii de vară a fost foarte mare. De asemenea, participanții au apreciat calitatea organizării, condițiile de cazare, mesele oferite și materialele primite. Printre sugestiile de îmbunătățire se numără dezvoltarea programului astfel încât să permită realizarea unor workshopuri destinate atât companiilor cât și mediului academic, care să permită aprofundarea temelor prezentate. Organizarea acestor workshopuri ar putea fi realizată de-a lungul anului, în București în format intensiv specific activităților executive education.

În concluzie, considerăm obiectivele proiectului realizate. În baza interacțiunii cu participanții și lectorii invitați, considerăm utilă continuarea organizării acestei școli de vară.

Data science este unul dintre domeniile prioritare de dezvoltare în lume și este necesară dezvoltarea unei comunități puternice în jurul acestui domeniu la nivel național pentru a contribui la creșterea competitivității economice și academice de nivel național. Menționăm că



Academia de Studii Economice din București
Bucharest Business School (Școala de Afaceri)

Calea Griviței Nr. 2-2A, 010731
Sector 1, București, România
office@bbs.ase.ro, +4 (021) 312 97 24
<http://www.bbs.ase.ro>



școala de vară organizată de universitatea noastră și ajunsă la a treia ediție a fost prima din România pe această temă și considerăm că contribuie într-un mod semnificativ la capitalul de imagine pentru universitatea noastră, plasându-ne printre actorii principali ai domeniului, la nivel național. Cu ocazia acestei a treia editii scoala de vara a crescut prin diversitatea internationala cat si prin numarul semnificativ de lectori si de participanti.

De asemenea, acest proiect răspunde mai multor obiective de internaționalizare din strategia instituțională și poate constitui fundamentul unei colaborări viitoare de anvergură mai mare cu universitățile de la care provin lectorii și cu companiile de la care provin o parte dintre cursanți.

Conf. univ. dr. Vasile Aleksandru STRAT

Decan Bucharest Business School



Academia de Studii Economice din București
Bucharest Business School (Școala de Afaceri)

Calea Griviței Nr. 2-2A, 010731
Sector 1, București, România
office@bbs.ase.ro, +4 (021) 312 97 24
http://www.bbs.ase.ro



Data Science Summer School, 3rd edition

<https://datascience.ase.ro>

July 22-31, 2022

Predeal, Romania¹

Organized by [Bucharest University of Economic Studies](#), in collaboration with the [GATE Institute](#) at [Sofia University "St. Kliment Ohridski"](#) and the [InterTwino](#) and [DataCloud](#) projects.



DataCloud

GATE

Inter
Twino

Goal:

The goal of the summer school is to familiarize students with relevant state of the art topics in data science. The program will cover fundamentals of data science and focus on the following key data science topics:

- Data analytics and statistics
- Machine learning
- Causal inference
- Time series, graphs, text processing
- Data visualization
- Data pipelines (data enrichment pipelines, machine learning pipelines)

The program will consist of a combination of lecture-style talks introducing various data science paradigms and methods, hands-on sessions, and student projects.

¹ The Data Science International Workshop - Summer School will be held as a live event on site in Predeal, Romania, in compliance with all applicable precautionary measures.



Academia de Studii Economice din București
Bucharest Business School (Școala de Afaceri)

Calea Griviței Nr. 2-2A, 010731
Sector 1, București, România
office@bbs.ase.ro, +4 (021) 312 97 24
http://www.bbs.ase.ro



The summer school aims to have a practical orientation, with Python and Jupyter Notebooks being used to exemplify many of the topics covered at the summer school.

At the end of the summer school, the students are expected to have an understanding of key paradigms used in data science and be able to practically apply them in data science projects.

Prerequisites:

Familiarity with computer programming and basic knowledge about Python, interest in working with data, enthusiasm, and willingness to learn new things!

Basic knowledge of linear algebra, probability theory, and knowledge representation would be useful, though not strictly necessary.

Lecturers and instructors:

- **Dan Nicolae** (University of Chicago, USA), Professor, PhD
<https://www.linkedin.com/in/dan-nicolae-221991a>
- **Razvan Bunescu** (University of North Carolina at Charlotte, USA), Associate Professor, PhD
<https://www.linkedin.com/in/razvan-bunescu-8097956>
- **Maryna Waszak** (SINTEF AS, Norway), Research Scientist, PhD
<https://www.linkedin.com/in/maryna-waszak-811b9a27>
- **Carlos A. Iglesias** (Universidad Politécnica de Madrid, Spain), Professor, PhD
<https://www.linkedin.com/in/cif2cif>
- **Gabriel Terejanu** (University of North Carolina at Charlotte, USA), Associate Professor, PhD
<https://www.linkedin.com/in/gabrielterejanu>
- **Dumitru Roman** (SINTEF / University of Oslo, Norway), Senior Research Scientist / Associate Professor, PhD
<https://www.linkedin.com/in/titiroman>
- **Vassil Vassilev**, (London Metropolitan University, UK and GATE Institute, Bulgaria), Professor in AI and Intelligent Systems, PhD
<https://www.linkedin.com/in/vvassilev>
- **Nikolay Nikolov** (SINTEF AS, Norway), Research Scientist
<https://www.linkedin.com/in/nikolay-nikolov-a9672659>
- **Wiktór Sowinski-Mydlarz** (London Metropolitan University, UK and GATE Institute, Bulgaria), Senior Research Scientist, PhD
<https://www.linkedin.com/in/viktor-sowinski-mydlarz-32a9a5101>
- **Brian Elvæsæter** (SINTEF AS, Norway), Research Scientist
<https://www.linkedin.com/in/elvæsæter>



TENTATIVE SCHEDULE

		Day 1 (23.07)	Day 2 (24.07)	Day 3 (25.07)	Day 4 (26.07)	Day 5 (27.07)	Day 6 (28.07)	Day 7 (29.07)	Day 8 (30.07)		
Breakfast (8am-9am)	Arrivals (22.07)										Departures (31.07)
Morning session (9am-12pm)		Statistics for data science	Statistical learning (hands-on)	Machine learning (hands-on)	Causal inference and machine learning (incl. hands-on)	Knowledge graphs and graph databases (incl. hands-on)	Graph analytics and data visualization (incl. hands-on)	Text processing (incl. hands-on)	Individual group/project work		
Lunch break and socializing activities (12am-2.30pm)											
Afternoon session (2.30pm-5.30pm)		Data science with Python (hands-on) & Projects discussions	Intro to machine learning	Deep learning with neural networks (incl. hands-on)	Time series analytics (incl. hands-on)	Social event	Data enrichment (incl. hands-on)	Operationalizing machine learning pipelines (incl. hands-on)	Individual group/project work & Projects presentations and final discussions		
Individual group/project work and/or free time (5.30pm-7pm)		Intro event									
Dinner (7pm-9pm)											



Statistics for data science (*Dan Nicolae*)

- A data science pipeline
- Data exploration
- Statistical inference with resampling methods

Data science with Python (hands-on) & Projects discussions (*Dan Nicolae, Razvan Bunescu, Gabriel Terejanu*)

- Intro to Python
- Pandas and data frames
- Probability and simulations

Statistical learning (hands-on) (*Dan Nicolae*)

- Regression models and inference
- Prediction and classification

Intro to machine learning (*Razvan Bunescu*)

- Feature vector representations
- ML for Classification
- ML for Regression
- Clustering

Machine learning (hands-on) (*Razvan Bunescu*)

- ML algorithms in Python
 - Implementation using NumPy
 - The *sklearn* library
 - Visualization using Matplotlib
- Experimental evaluation of ML models
 - Linear vs. non-linear classification

Deep learning with neural networks (incl. hands-on) (*Gabriel Terejanu*)

- Representation learning
- Deep learning with neural networks
- Implementation in *PyTorch*
 - Regression and gradient descent
 - Logistic regression and NNs for non-linear classification
 - Model Explainability using *Captum*

Causal inference in machine learning (incl. hands-on) (*Gabriel Terejanu*)

- Why do we need causality in data science?
- What is a causal model?
- What is an intervention?



-
- How to estimate causal effects using *DoWhy*?
 - How to learn a causal model?

Time-series analytics (*Maryna Waszak*)

- Time series analytics techniques: filtering methods, interpolation, extrapolation, prediction with ML
- Time series databases
- Python libraries for working with time-series data

Knowledge graphs and graph databases (incl. hands-on) (*Dumitru Roman, Brian Elvesæter*)

- Knowledge Graphs
- NoSQL databases
- Graph databases (focus on Neo4j)
 - Data model and data modeling
 - Query language
 - Graph algorithms / analytics / ML

Graph analytics and data visualization (incl. hands-on) (*Carlos A. Iglesias*)

- Intro to graph analytics
- Graph analytics with NetworkX
 - Graph manipulation
 - Graph construction
 - Graph analysis metrics
 - Social networks (ego networks, etc.)
 - Clustering and community detection
 - (Link prediction)
- General intro to data visualization
- Data visualization techniques with Seaborn

Data enrichment (*Dumitru Roman, Nikolay Nikolov, Brian Elvesæter*)

- Data preparation; cleaning, annotating and enriching data
- Semantic data enrichment
- Tools for semantic enrichment
- Data enrichment pipelines
- Example application for data enrichment

Text processing (*Carlos A. Iglesias*)

- From text to data
 - Tokenization, Stemming/Lemmatization, Stop-words, Spell-checking
- Finding text (search engines)



- Inverted index, similarity models
- Learning on text
 - Natural Language Processing – chunking, parsing sentences
 - Latent Semantic Indexing
 - Word2vec and other term representation models
- Combining text and non-text data for ML

Operationalizing machine learning pipelines (*Vassil Vassilev, Wiktor Sowinski-Mydlarz*)

- What are Machine Learning pipelines
- Introduction to Software Containers and Cloud
- Deployment, orchestration, monitoring of ML pipelines on the Cloud – using python libraries
- Applications example

Software (preliminary): Software tools/services to be used during the sessions and hands-on include:

- Anaconda (<https://www.anaconda.com>): Installation instructions for various platforms can be found at: <https://docs.anaconda.com/anaconda/install>
 - A number of tools and libraries that we will use can be configured from Anaconda: Python 3, NumPy, SciPy, Matplotlib, nltk, Jupyter Notebook, Ipython, Pandas, Scikit-learn and Seaborn.
 - For Deep Learning we will use:
 - PyTorch (<https://pytorch.org>) to build models. This can be installed from Anaconda, with 'conda' from the command line, the actual command line depends on the platform as follows: using the GUI on pytorch.org, choose the appropriate OS, conda, Python 3.6, CUDA None (for the examples the CPU version should suffice).
 - Captum (<https://captum.ai>) to interpret models. This can be installed from Anaconda using 'conda' from the command line (conda install captum -c pytorch).
 - For Causal Inference we will use DoWhy (<https://microsoft.github.io/dowhy>), which can be installed using 'conda' from the command line (conda install -c conda-forge dowhy).
 - For Text Processing, SpaCy can be installed with 'conda' from the command line as shown at <https://pypi.org/project/spacy>.
- DataGraft (<https://datagraft.io>): Software as a service that requires sign up for a free (DataGraft platform account at https://datagraft.io/users/sign_up where you will be required to provide a username, email and password to access the website).
- Neo4j (<https://neo4j.com>): Installation and documentation can be found at <https://neo4j.com/developer/get-started>. We will use the online sandbox service provided at <https://neo4j.com/sandbox>, so no installation on local machines is needed for



Academia de Studii Economice din București
Bucharest Business School (Școala de Afaceri)

Calea Griviței Nr. 2-2A, 010731
Sector 1, București, România
office@bbs.ase.ro, +4 (021) 312 97 24
http://www.bbs.ase.ro



experimenting with Neo4j. Alternatively you can download and install Neo4j Desktop, which provides a convenient way for developers to work with local Neo4j databases (this can be downloaded from <https://neo4j.com/download-center/#desktop>). We will also use Neo4j Graph Data Science (<https://neo4j.com/product/graph-data-science>) which comes with Neo4j.

- Docker (<https://www.docker.com>): An open-source containerization platform that will be used for ML pipelines. Installation instructions can be found at <https://docs.docker.com/engine/install>.



Academia de Studii Economice din București
Bucharest Business School (Școala de Afaceri)

Calea Griviței Nr. 2-2A, 010731
Sector 1, București, România
office@bbs.ase.ro, +4 (021) 312 97 24
http://www.bbs.ase.ro



Bios

Dan Nicolae (University of Chicago, USA), Professor, PhD



Dan Nicolae is Professor and Chair of Statistics at University of Chicago where he is also Professor in the Department of Medicine, Section of Genetic Medicine. Originally from Craiova, Dan Nicolae graduated from “Facultatea de Matematica” of University of Bucharest in 1995, and has obtained his PhD in Statistics from University of Chicago in 1999. He has held visiting positions at deCode Genetics in Iceland, University of Oxford and UCLA. His research focus is on developing statistical and computational methods for understanding the human genetic variation and its influence on the risk for complex traits, with an emphasis on asthma related phenotypes. The methodology developed in his group is based on foundations in high-dimensional inference, machine learning and data science. The current focus in his statistical genetics research is centered on data integration and system-level approaches using large datasets that include clinical and environmental data as well as various genetics/genomics data types: DNA variation, gene expression (RNA-seq), methylation and microbiome. Dan Nicolae has advised more than 50 researchers at all levels (Master, PhD and Post-Doctoral) and has published more than 130 articles in scientific journals. He has been member of numerous Advisory and Editorial Boards and has served on panels in United States, Canada, UK and European Union.

Gabriel Terejanu (University of North Carolina at Charlotte, USA), Associate Professor, PhD



Dr. Gabriel Terejanu is an Associate Professor of Computer Science at UNC Charlotte. Previously, he had a faculty appointment at University of South Carolina and a fellowship at University of Texas at Austin. His industry experience includes software engineer and quantitative researcher positions in information technology and financial services. His research interests are in causal modeling, uncertainty quantification, machine learning, explainable AI, and coupling of domain knowledge including physics-based models with data-driven models and experimental measurements. His current work on causal modeling is supported by Army Research Office and Lowe’s Innovation Fund, and previously he received funding from the National Institute of Food and Agriculture and National Science Foundation. Webpage: <https://www.UncertaintyQuantification.org>.

Razvan Bunescu (University of North Carolina at Charlotte, USA), Associate Professor, PhD



Academia de Studii Economice din București
Bucharest Business School (Școala de Afaceri)

Calea Griviței Nr. 2-2A, 010731
Sector 1, București, România
office@bbs.ase.ro, +4 (021) 312 97 24
http://www.bbs.ase.ro



Razvan C. Bunescu is an Associate Professor in the Department of Computer Science at UNC Charlotte. Previously, he was a Professor in the School of Electrical Engineering and Computer Science at Ohio University. He received the PhD degree in computer science from the University of Texas at Austin in 2007, with a dissertation on machine learning methods for information extraction. His research interests lie in the general area of machine learning, with a focus on applications in natural language processing, music information retrieval, biomedical informatics, computer architecture, and more recently computational creativity. His work has been funded by grants from the National Science Foundation, the National Institutes of Health, and the Air Force Research Laboratory. Webpage: <https://webpages.charlotte.edu/rbunescu>.

Maryna Waszak (SINTEF AS), Research Scientist, PhD



Maryna Waszak is a Research Scientist at SINTEF Digital Smart Data group. The expertise of the group focuses on the fusion of data of different modalities and from highly heterogeneous sources. Currently her work is tailored around applications in the processing industry in the context of digital twins. Maryna Waszak holds a PhD in Electrical Engineering (2016) where she was developing a new motion correction technique for magnetic resonance (MR) imaging. This scientific research required planning of experiments and analysis of imaging as well as multi-source time series data. This included also close collaboration with experts from different fields as MR sequence design, machine learning, signal processing or practical neurology and radiology. Further, Maryna Waszak has extensive professional experience in product development in the medical device industry. As a Project Manager and Software Engineer, she was leading activities around the algorithmic design, implementation, integration, and delivery of new features for a software system.

Carlos A. Iglesias (Universidad Politécnica de Madrid, Spain), Professor, PhD



Carlos A. Iglesias received the telecommunications engineering degree and the PhD degree in telecommunications, both from the Universidad Politécnica de Madrid (UPM), in 1993 and 1998, respectively. He is a professor in the Telecommunications Engineering School, UPM, Spain and Head of the Intelligent Systems Research Group, since 2014. He has been a principal investigator on numerous research grants and contracts in the field of advanced social and IoT systems, funded by the regional, national and European bodies. His main research interests include social computing, multiagent systems, information retrieval, sentiment and emotion analysis, linked data, and web engineering. He participates in the Big Data Value Association in the groups of Data Visualization and Finance.



Dumitru Roman (SINTEF AS / University of Oslo, Norway), Senior Research Scientist / Associate Professor, PhD



Dumitru Roman works as a Senior Research Scientist at SINTEF AS (Norway) – the largest independent research organization in Scandinavia. He has wide experience with initiating, leading, and carrying out data-driven and research-intensive projects, participating in dozens of large international projects during the past 14 years in which he has collaborated with large numbers of private companies, public sector organizations, universities, and research institutes. He is currently active in the data management field, focusing on innovation projects enabling data-driven business products and services. He holds an adjunct associate professorship at the University of Oslo, Norway.

Vassil Vassilev (London Metropolitan University, UK and GATE Institute, Bulgaria), Professor, PhD



Dr. Vassil Vassilev is a Professor in AI and Intelligent Systems, leading the Data Management group of GATE Institute. He holds a PhD in AI from Bulgarian Academy of Sciences. Since 2000 he has been working in UK, where he is a Director of the Cyber Security Research Centre of London Metropolitan University. His GATE team established the private cloud infrastructure of GATE, which operates under the control of Kubernetes container management system. On the GATE cloud the team successfully completed two projects for processing real-time data using a variety of data analytics methods ranging from statistical correlation of streamlined data, through detection of data patterns using support vector machines (SVM) to forensic analysis using deep learning based on convolution neural networks (CNN). Prof. Vassilev is currently working on the second phase of a project for integral analysis of the factors of environment pollution in Sofia, which will utilize the power of Hadoop as a data repository and Sparc as analytics engine.

Nikolay Nikolov (SINTEF AS), Research Scientist



Nikolay Nikolov is a Research Scientist at SINTEF Digital Smart Data group. Nikolay is a PhD fellow at the University of Oslo and a research scientist in the Smart Data group at SINTEF Digital. His current research is focused around novel methods to support the lifecycle of Big Data pipelines processing, enabling their definition, model-based analysis and optimization, simulation, and deployment on top of decentralized heterogeneous infrastructures. Nikolay has been doing applied research related to data management, data integration, data enrichment, big data, and the semantic web since 2014 as part of SINTEF Digital. During the recent years, he has been involved in research, implementation and technical coordination in the context of several national and international research projects in the area of data-driven innovation. Nikolay holds a joint Erasmus Mundus



M.Sc. degree in Service Engineering from Stuttgart University, University of Crete and Tilburg University. Nikolay's main interest and focus is on approaches for supporting the lifecycle of Big Data pipelines on the Computing Continuum.

Wiktor Sowinski-Mydlarz (London Metropolitan University, UK and GATE Institute, Bulgaria), Senior Research Scientist, PhD



Dr. Wiktor Sowinski-Mydlarz is a senior researcher at GATE and post-doctoral researcher at the Cyber Security Research Centre of London Metropolitan University. His PhD is the area of hybrid frameworks for data processing, which combine logical and machine learning methods for data analysis. He is highly experienced in software integration, particularly in containerization, orchestration and monitoring of data analytics engines on the cloud. Dr. Sowinski-Mydlarz has been working with Prof. Vassilev over the last 5 years on a number of projects, funded by Lloyds Banking Group and Innovate UK. He is currently working on the integration of Fiware components for identity management and access control into the GATE Data Platform.

Brian Elvesæter (SINTEF AS, Norway), Research Scientist



Brian Elvesæter is a research scientist at the department for Sustainable Communication Technologies at SINTEF Digital. He holds a Cand. Scient. degree in computer science from the University of Oslo in 2000. He has been doing research and development on model-driven software engineering, software development methods, service-oriented and component-based software architectures, enterprise interoperability and data management since 2000. His current research focuses on data-and-platform-as-a-service, data management, linked data, big data and data pipelines, knowledge graphs and semantic technologies, and graph analytics in combination with AI and Machine Learning. He has experience as technical manager and work package leader from a number of European projects in FP5, FP6, FP7 and H2020.

	Participant	Nume	Prenume
1	Participant	Agafitei	Diana
2	Participant	Baboi	Catalin
3	Participant	Banica	Mihai
4	Participant	Banutoiu	Dorian
5	Participant	Boboc	Cristina
6	Participant	Boerescu	Julia-Maria
7	Participant	Borukova	Milena
8	Participant	Chichernea	Ioana
9	Participant	Chiuchisan	Iuliana
10	Participant	Conda	Alexandra



Academia de Studii Economice din București
Bucharest Business School (Școala de Afaceri)

Calea Griviței Nr. 2-2A, 010731
Sector 1, București, România
office@bbs.ase.ro, +4 (021) 312 97 24
http://www.bbs.ase.ro



11	Participant	Diaconu	Delia
12	Participant	Diaconu	Madalina
13	Participant	Eslamirad	Nasim
14	Participant	Găman	Ștefan
15	Participant	Geman	Oana
16	Participant	Hajyyev	Shamuhmet
17	Participant	Hlihor	Petru
18	Participant	Horoiu	Maria
19	Participant	Ioana	Ionescu
20	Participant	Istrate	Cristian-Alexandru
21	Participant	Karamitov	Kaloyan
22	Participant	Khan	Haroon
23	Participant	Ma	Xiang
24	Participant	Micu	Diana-Ioana
25	Participant	Mitkov	Radostin
26	Participant	Nikolova	Stanimira
27	Participant	Placinta	Dimitrie-Daniel
28	Participant	Ruxandaru	Iulia-Maria
29	Participant	Simion	Alexandru
30	Participant	Simion	Ștefan-Alexandru
31	Participant	Soare	Florin-Razvan
32	Participant	Șoșea	Miruna
33	Participant	Spătaru	Anda
34	Participant	Ștefan	Roberto-Ionuț
35	Participant	Sturza	Mihai-George
36	Participant	Szabo	Alexandru-Ștefan
37	Participant	Taulescu	Costin Andrei
38	Participant/Organizator	Caplescu	Raluca
39	Participant/Organizator	Krasteva	Iva
40	Participant/Organizator	Proșcanu	Cosmin
41	Participant/Organizator	Proșcanu	Miruna
42	Participant/Organizator	Strat	Vasile Alecsandru