TUTORIALS AND POSTERS AT THE OPENTECH AI WORKSHOP HELSINKI

Open technologies, AI, Apache Spark, Keras, TensorFlow, Healthcare, R, Watson, and More – for Beginners & Experts & In-Between

#opentechAI

Feedback on this document to malaika@us.ibm.com

MARCH 13, 2018

HOSTING COMPANIES: IBM AND VTT

Tutorials Address: IBM, Laajalahdentie 00330 Helsinki, Finland

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TUTORIALS OVERVIEW – 13 MARCH 2018 - 13:00-17:00

Time	Location	Title	Presenters	Laptop
13:00-17:00 15:00 Break	Auditorium Floor: 2nd	Opentech AI: AI Architecture and the Future of AI	Daniel Pakkala (VTT) Jim Spohrer (IBM)	No
13:00-14:00	F10 Floor: 6th	Open	Open	Yes
14:00-15:00	F10 Floor: 6th	OpenPower and AI	Ganesan Narayanasamy (IBM)	No
15:15-17:00	F10 Floor: 6th	AI for Decision Support in Health - how to make it work	Mark van Gils (VTT)	No
13:00-16:30 15:00 Break	202 Floor: 2nd	Hands-on TensorFlow and Keras Programming for Beginners	Ton Ngo (IBM), Paul Van Eck (IBM)	Yes
13:00-16:30 Break 15:00	203 Floor: 2nd	Keras Deep Learning Models on Apache Spark using TensorFlow, Apache SystemML, DeepLearning4J	Romeo Kienzler (IBM)	Yes
13:00-14:00	BR1 Floor: 1st	Quantum Computing - Intro	Teppo Seesto (IBM)	No
14:00-15:00	BR1 Floor: 1st	IBM Academy of Technology - Intro	Susan Malaika (IBM)	No
15:15-17:00	BR1 Floor: 1st	Deep Learning for Mitosis Detection	Mike Dusenberry (IBM)	Yes
13:00-15:00	F5 Floor: 6th	R & TensorFlow	Augustina Ragwitz (IBM)	No
15:15-17:00	F5 Floor: 6th	Running an AI Workload with IBM PowerAI	Catherine Diep (IBM), Simeon Monov (IBM)	Optional

Please use this URL https://ibm.biz/BdZYZx to get a cloud account if there is a hands-on element for the tutorial that you will attend

TUTORIAL DETAILS

To register: https://www.eventbrite.com/e/1st-international-workshop-on-opentech-ai-tickets-42648142743

TUTORIAL TITLE: OPEN TECH AI - AI ARCHITECTURE AND THE FUTURE OF AI

Location: Auditorium
Time: 13:00-17:00 including breaks
Presenters:: Daniel Pakkala (VTT), Jim Spohrer (IBM)
Attendee Prereqs: None
Abstract:
Some say software is eating the world; we see it democratizing access and leveling up the the world. Certainly, GitHub and Kaggle are exploding with open source code and a wide range of challenges. Artificial intelligence (AI) is experiencing a renaissance as well, but there are many things to know about open AI code + data + models + challenges/leaderboards + communities. For six months IBM's Jim Spohrer and VTT's Daniel Pakkala have been collaborating to make sense of Opentech AI, and this tutorial will help provide those new to open source AI a gentle introduction, including discussion of AI architecture, and a view on the future of AI as well. This tutorial also will help set the stage for the keynotes and panels coming on the following day.
Schedule:
13:00-13:15 Introduction to Opentech AI, Jim Spohrer and Daniel Pakkala
13:15-14:45 opentech AI Architecture and Ecosystem, Daniel Pakkala
14:45-15:00 Q&A discussion
15:00-15:30 Break
15:30-16:45 Future of AI: Industry/Region-Specific Leaderboard Roadmaps, Jim Spohrer
16:45-17:00 Q&A discussion
Links:
Opentech AI Blog: https://opentechai.blog/
Future of AI: https://www.slideshare.net/spohrer/nsf-20180124-v18
AI Leaderboards: https://www.slideshare.net/spohrer/leaderboards-80909263

TUTORIAL TITLE: AI FOR DECISION SUPPORT IN HEALTH - HOW TO MAKE IT WORK

Location: F10
Time: 15:15-17:00 including breaks
Presenters: Mark van Gils (VTT)
Attendee Prereqs: None
Abstract:

Healthcare is one of the most conservative fields in the uptake of new technologies. Reasons for this range from regulatory considerations to (informal and formal) processes that are difficult to change, but also technical issues, such as problems with the data and the difficulty of proving performance play a strong role. In this tutorial we will discuss issues we may run into when considering AI approaches for health applications. Subjects include (but are not limited to): how to get the input data right (poor quality data, missing data, harmonization), (lack of) Gold Standards and objective measures, black-box approaches vs. explainable models, data visualization, usability, classification performance vs cost-effectiveness vs practical meaningfulness. Examples of the issues and practical hints will be given based on real-life example cases of implemented systems.

TUTORIAL TITLE: HANDS-ON TENSORFLOW AND KERAS PROGRAMMING

Time: 13:00-16:30 including breaks
Location: 202
Presenters: Ton Ngo, Paul Van Eck
Attendee Prereqs:
Basic Python coding skills
Tensorflow + Keras installed on their laptop. Instructions found
https://www.tensorflow.org/install/ and https://keras.io/#installation

Abstract:
TensorFlow is an open-source software library for Deep Learning originally developed by the Google Brain Team. Open-sourced in November 2015, TensorFlow has been rapidly gaining adoption in both the industry and academia and has been used in many successful projects at Google such as translation, speech to text, Gmail smart reply, etc. The platform provides a rich library of algorithms and utilities for data science, as well as essential developer tools.
In parallel with TensorFlow, Keras is a high-level Python API for implementing neural networks, allowing for quick and easy programming. A Keras model may require only a dozen lines of code and can run on TensorFlow, CNTK or Theano, with TensorFlow as the default and recommended backend.
In this hands-on programming class, we will begin with a quick overview and dive into key programming concepts in both TensorFlow and Keras. We will code step by step two Deep Learning models for the MNIST problem. Since the domain is image classification, we will

describe the relevant algorithms (convolution, softmax) and walk through the thought process in designing a neural network.

Bio:

Ton Ngo
Ton is a senior software developer in the IBM Cognitive OpenTech Group at the IBM Silicon Valley Lab. He has been active in the open-source community in the past 4 years, currently working on TensorFlow and Deep Learning. He has been giving talks and programming tutorials on TensorFlow in San Francisco, Seattle and New York. He was a core contributor in OpenStack for Magnum and Heat-Translator, focusing on the networking and storage support for container orchestrator such as Kubernetes. He gave frequent talks at the OpenStack Summits worldwide. Previously he was with the IBM Research Lab at Yorktown and Almaden and has published papers on a wide range of subjects.

Paul Van Eck
Paul is currently a software engineer in the Cognitive OpenTech group at IBM. Over the past four years, he has been actively involved in cloud open source technologies and communities such as OpenStack and Kubernetes. However recently, Paul has been focusing on deep learning and TensorFlow and has taught several deep learning-based classes with aims to explore, contribute, and advocate more in this area.

TUTORIAL TITLE: KERAS DEEPLEARNING MODEL TRAINING AND DEPLOYMENT ON APACHE SPARK USING TENSORFLOW APACHE SYSTEMML, DEEPLEARNING4J ON IBM DATASCIENCE EXPERIENCE AND IBM WATSON MACHINE LEARNING

Time: 13:00-16:00 including breaks
Location: 203
Presenter: Romeo Kienzler
Attendee Prereqs:
Laptop and IBM DSX account :
https://datascience.ibm.com/registration/stepone?context=analytics
Note: This tutorial is based on the brand new IBM Course on Coursera:
https://www.coursera.org/learn/ai
Abstract: Everyone who has implemented Deep Neural Networks from scratch on top of linear algebra using TensorFlow, Apache SystemML or PyTorch sometimes feels the pain of getting the shape of tensors right. Whereas low level neural network hacking is fun and teaches you a lot it also eats up a lot of time. I've recently re-implemented 3 man-months of linear algebra neural network code in three days using Keras. In this talk I'll explain how Keras can be used to get neural networks done incredibly fast and how training and scoring can be scaled-out on Apache Spark using Apache SystemML and DeepLearning4J as execution engine for Keras models. This is very handy in project where 90% of the data engineering platform is anyway on top of an Apache Spark cluster. Also I find Apache Spark much more handy for data processing than pure TensorFlow for example. In addition, I show how those trained models can be deployed on top of TensorFlow in a scalable and re-usable fashion in IBM Watson Machine Learning. I'll also cover GPU as important accelerator for training but especially for scoring since it pushed latency down.

Bio:
Romeo Kienzler is Chief Data Scientist and DeepLearning/AI Engineer at IBM Watson IoT and as IBM Certified Senior Architect he helps clients worldwide to solve their data analysis challenges. He holds an M. Sc. (ETH) in Computer Science with specialisation in Information Systems, Bioinformatics and Applied Statistics from the Swiss Federal Institute of Technology Zurich. He works as an Associate Professor for artificial intelligence at a Swiss University and his current research focus is on cloud-scale machine learning and deep learning using open source technologies including R, Apache Spark, Apache SystemML, Apache Flink, DeepLearning4J and TensorFlow. He also contributes to various open source projects. He regularly speaks at international conferences including significant publications in the area of data mining, machine learning and Blockchain technologies. As a course instructor he teaches data science using ApacheSpark on coursera: https://www.coursera.org/learn/exploring-visualizing-iot-data Recently his latest book on Mastering Apache Spark V2.X has been published: http://amzn.to/2vUHkGl Romeo Kienzler is a member of the IBM Technical Expert Council and the IBM Academy of Technology - IBM's leading brain trusts. #ibmaot

TUTORIAL TITLE: QUANTUM COMPUTING - INTRO

Time: 13:00-14:00
Location: BR1
Presenter: Teppo Seesto
Attendee Prereqs: None
Abstract:
Quantum computing is emerging technology that will change the way how computers work. The world of quantums is quite weird but IBM among others has shown that quantum mechanics can be used computing. First IBM Q quantum computers are already there and researchers round the world has started to build first applications. AI is one of the areas that is expected to get great benefit from quantum computing. Everyone can start to program quantum code with QISKit in IBM Quantum Experience located in IBM Cloud. The Quantum Information Software Kit (QISKit for short) is a software development kit (SDK) for working with OpenQASM and the IBM Q experience (QX). In this session, we will give an introduction to quantum computing and IBM Quantum Experience.

Bio:
Teppo Seesto is technical architect and team leader in IBM Nordic Solution Technical Sales team. After 30 years of experience with IT infrastructures he is now concentrating to AI and quantum computing. He is a member of European IBM Q evangelist team.

TUTORIAL TITLE: IBM ACADEMY OF TECHNOLOGY - INTRO

Time: 14:00-15:00
Location: BR1
Presenter: Susan Malaika
Attendee Prereqs: None
Abstract: The IBM Academy of Technology is an IBM internal organization made up of 800 members and 20,000 affiliated members world-wide. They are all IBM employees who volunteer to work on technology projects, because of their interests. The projects are sponsored by senior leadership in IBM and fulfil the personal goals of employees, e.g., to self-educate or to publish, as well as those of the company, e.g., to explore an emerging technical area or to create best practices.

This session will outline how the IBM Academy operates and its successes, to foster dialog and collaboration with workshop attendees, with the potential of creating longer lasting relationships through working on projects of mutual interest. There will be a special emphasis on the Nordic region. More information appears here: https://www.ibm.com/blogs/academy-of-technology/

Bio:
Susan Malaika is Senior Technical Staff in IBM's Digital Business Group and a member of the IBM Academy of Technology Leadership Team. Susan is responsible for data related technologies in IBM's Open Tech group: increasing IBM's adoption and contribution to open source as well as engagement with developers. Currently she is focused on Data Governance (via the ODPi consortium) and AI ecosystems. Susan was a founder of the JanusGraph project at the Linux Foundation, and she leads workshops, hackathons, and meetups and engages with universities globally - and in the MENA region. Susan also leads a tech community of a few hundred members in the New York area. For more information about Susan please see https://developer.ibm.com/opentech/category/susan-malaika/

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TUTORIAL TITLE: DEEP LEARNING FOR MITOSIS DETECTION

Location: BR1 1st Floor
Time: 15:15-17:00 including breaks
Presenters:: Michael Dusenberry (IBM)
Attendee Prereqs: None
Abstract:
To help advance the current state-of-the-art in automatic mitosis detection and tumor proliferation scoring, the Tumor Proliferation Assessment Challenge 2016 (TUPAC16) was created as a "Grand Challenge" for the 2016 Medical Image Computing and Computer Assisted Intervention (MICCAI 2016) conference. In this challenge, which is open for post-competition submissions, the goal is to develop state-of-the-art algorithms for (1) automatic prediction of tumor proliferation scores from whole-slide histopathology images (WSI) of breast tumors, as well as (2) automatic mitosis detection. To support the development of these new algorithms, a dataset consisting of 500 WSIs with known tumor proliferations scores is provided to contestants, as well as an auxiliary dataset containing mitotic figures.
This tutorial will guide the audience through a deep learning approach to the problem of mitosis detection in high-resolution tumor slide images. The approach will make use of deep convolutional neural nets, transfer learning, data augmentation and marginalization, etc., using Python, TensorFlow, and GPU clusters.
Bio:
Mike Dusenberry is a machine learning engineer at the IBM Spark Technology Center. He was on his way to an M.D. and a career as a physician in his home state of North Carolina when he teamed up with professors on a medical machine learning research project. A few years later in San Francisco, Mike is focused on deep learning algorithms and researching medical applications for deep learning.

TUTORIAL TITLE: R AND TENSORFLOW

Time: 13:00-15:00 including breaks
Location: F5
Presenter: Augustina Ragwitz

Attendee Prereqs: None

Abstract:

R - This session will introduce the R community and resources for using the R programming language focusing on the Tidyverse. We will use an R notebook that will be available in Github for participants to download and experiment with.

R + Tensorflow - R has some great features that make integrating Tensorflow into your existing research very easy. This session will highlight features where R stands out and will provide a tour of resources available for learning more.

Bio:

I am an open source data science advocate with a focus on the R community. I am passionate about data literacy and believe quantitative metrics should support a Qualitative story. After an extensive tech career, my recent work has me returning to my Social Science roots! More information about my research is available on my personal site, http://rhappy.fun.

TUTORIAL TITLE: OPENPOWER AND AI

Time: 14:00-15:00 including breaks
Location: F10
Presenter: Ganesan Narayanasamy
Attendee Prereqs: None
Abstract:
The OpenPOWER initiative has a major meeting coming up in Las Vegas at IBM THINK conference: https://openpowerfoundation.org/summit-2018-03-us/ This talk will discuss the origins, outcomes, and future directions of OpenPOWER, with special emphasis on PowerAI. The benefits of PowerAI, and key use cases will be reviewed.

Bio:
Ganesan Narayanasamy is an OpenPOWER leader for Academia and research at the IBM Lab. Ganesan is best known for his contributions to High Performance Computing as senior leader for nearly 1.5 decades. He is also leading the WW Academia workgroup for OpenPOWER and putting together OpenPOWER ECO System development activities like setting up OpenPOWER center of excellence, OpenPOWER labs, Curriculum development etc.

TUTORIAL TITLE: RUNNING AN AI WORKLOAD WITH IBM POWERAI

Time: 15:15-17:00 including breaks
Location: F5
Presenters: Catherine Diep, Simeon Monov
Attendee Prereqs: Laptop (optional)
Abstract:
IBM Power Systems are always built for the most demanding and data intensive computing workloads. From the processor architecture and server hardware to software and services support, IBM Power Systems have been re-imaged for infrastructure in the AI era. PowerAI is a package of software disthributions for many of the major deep learning software frameworks for model training such as TensorFlow, Caffe, Chainer, Torch, Theano and their associated libraries like cuDNN, nvCaffe, and others.
PyTorch is a relatively new deep learning framework. Yet, it has begun to gain adoption especially among researchers and data scientists. The strength of PyTorch is its support of dynamic computational graph while most deep learning frameworks are based on static computational graph.
In this session, we will introduce IBM PowerAI Marketplace Trial server program. We will demonstrate how to request a trial environment and train an example Natural Language Processing AI workload on PyTorch.

Bios:

Catherine Diep is a Solutions Architect and Performance Engineer in the Cognitive OpenTech group at IBM Silicon Valley Lab. Catherine has been actively involved in open source projects and communities since 2013. From mid-2015 to August 2017, as the community elected Project Team Lead and core contributor & reviewer, she had led the OpenStack RefStack project team

working on advocating and enabling OpenStack inter-operbilty via testing and verification. Currently, Catherine is involved in deep learning related projects such as Reading Comprehension using open source frameworks and APIs like PyTorch, TensorFlow, Keras, etc.

Simeon Monov is a Solutions Architect and Performance Engineer in the Cognitive OpenTech group at IBM Silicon Valley Lab. Simeon has been actively involved in open source projects and communities since 2013. He was involved in OpenStack community specializing in the virtual networking module Neutron. Simeon also worked on Juniper SDN solution Contrail involved in very early stage adoption and testing. Currently, Simeon is involved in deep learning related projects such as Reading Comprehension using open source frameworks and APIs such as PyTorch, Numpy, Spacy, TensorFlow, Keras, etc. Simeon is also involved in JanusGraph - Distributed graph database project. Simeon's current interests are in Deep Learning research and data science.

POSTERS OVERVIEW- 13 MARCH 2018, 17:30-19:30 (2ND FLOOR)

Location: Outside Auditorium 2nd Floor. Posters are part of the workshop welcome reception

Title	Presenter	Institution
Mental concentration sensor	Caj Södergård	VTT
Energy consumption prediction in shopping malls	Jussi Kiljander	VTT
Stochastic lot scheduling by reinforcement learning	Hannu Rummukainen	VTT
AI for decision support in complex diseases	Mark van Gils	VTT
Process oriented AI	Heli Helaakoski, Olli Saarela	VTT
From Smart to Wise Systems: shifting from Artificial Intelligence (AI) to Intelligence Augmentation (IA)	Clara Basano	Università Parthenope
Lessons learned from solution delivery building on Watson APIs - Discovery, Conversation, Knowledge Studio, etc.	Sara Elo Dean	IBM
AI in retail and eCommerce	Stephen Kwan	San Jose State University
IBM Silicon Valley Lab OpenTech Projects	Ton Ngo	IBM
Advanced Sports Coach, combining multiple conversations with dialog manager	Heikki Nieminen	AmerSports
Open AI versus Closed AI-Generated Applications in Arctic Tourism	Mariluz Soto, Sun Liping, Pia Keränen, Rosa Ballardini, Melanie Sarantou, Satu Miettinen	University of Lappland
Dynamical Multi-Agent Systems: formal verification, synthesis and strategic reasoning	Riccardo De Masellis, Valentin Goranko	Stockholm University
Deep Learning for Multi-person Human Pose Estimation Without A Person Detector	Oguzhan Gencoglu	Top Data Science Ltd
Practicing innovation through cognitive computing and artificial intelligence: The IBM Watson case	Marialuisa Marzullo, Cristina Mele, Tiziana Russo Spena	Unina
Biomedical Signal Analysis Team	Morteza Zabihi , Ali Bahrami Rad, Serkan Kiranyaz, Aggelos K. Katsaggelos, Moncef Gabbouj	Tampere University of Technology, Aalto University, Finland; Northwestern University, USA; Qatar University, Qatar.
Digital Business Ecosystem (DBE) Core Concept	Tomi Dahlberg, Kari Korpela, Karri Mikkonen	Åbo Akademi University, Lappeenranta University of Technology University of Turku

POSTER DESCRIPTIONS

POSTER TITLE: INFERRING STUDENTS' CONCENTRATION LEVELS IN DAILY LIFE USING BIOSIGNAL DATA FROM WEARABLES

Authors and contact info: Caj Södergård (Caj.Sodergard@vtt.fi) & Hermanni Hälvä (Halva.Hermanni@gmail.com)

Poster abstract: The ability to concentrate well is an important determinant of students' learning outcomes but remains poorly understood. In this work we investigated whether we can learn a mapping between students' biosignals and their concentration levels in their daily lives. For this, we used a state-of-the-art wearable to record students' heart rate, heart rate variability, skin temperature, skin conductivity and the frequency of postural changes. Additionally, students self-assessed and recorded their concentration levels using a smartphone application that we developed. A boosted regression trees machine learning model was trained on this data to classify study sessions into ones in which students concentrated well and ones in which they did not. Our model reached a classification accuracy of 80% and Matthews Correlation Coefficient of 0.3, thus performing above the random chance baselines of 55% and 0.0 respectively. Above average heart rate and below average skin temperature were identified as the best predictors of good concentration. Furthermore, the patterns of skin conductivity, heart rate variability and postural movements that we captured suggested that good concentration differs from cognitive stress, which has been the focus of many previous works. Hence, to help students improve their concentration levels, more research is needed to explore less understood emotional phenomena such as the feelings of achievement and 'flow', the feeling of being immersed in a sufficiently challenging task. Our approach has also practical implications. For example, since the results were attained using a multi-sensor wristband connected to a cloud rather than expensive medical equipment, our system could be easily scaled up to large user groups possessing wearables, both in commercial applications and academic research.

Submitted to IEEE Access 2018

POSTER TITLE: FROM SMART TO WISE SYSTEMS: SHIFTING FROM ARTIFICIAL INTELLIGENCE (AI) TO INTELLIGENCE AUGMENTATION (IA)

Authors and contact info: S. Barile, M. Ferretti, C. Bassano (clara.bassano@uniparthenope.it), P. Piciocchi, J. Spohrer, C. Pietronudo

Poster abstract: An intelligent machine can be a computer capable of mimicking the capabilities of the human brain - Artificial Intelligence (AI) -and at the same time a support to the functionality of our brain –Intelligence Augmentation (IA). Taking a metaphor (Mc Gee and Hadborg, 2004),

technologies, specifically AI, are at the same time a *servant* - replacing man in complex activities (elaborate calculations, complicated mechanical activities) -and a *Maestro* - empowering, instructing, and educating a man. In this assumption, exchange of information and knowledge must however be bi-directional, since even people can amplify the potential of a machine. Although the machines are now able to acquire information and knowledge more efficiently, they lack an emotional and social intelligence. Therefore, not only are they capable of improving their learning capacity, but they are not able to put their knowledge at the service of the whole system, mechanic and human indeed. Human intervention is inevitable; a person holds emotional and social capacities that make him able to use knowledge more effectively ggand suitable, taking care individual but even shared objectives by ensuring a mediation thanks to whole resonance and equifinality in values (Ackoff, 1989; Spohrer, Piciocchi, Bassano and Siddike, 2016).

However, our goal is to highlight that we are witnessing a change in the concept of intelligence transforming our way of being intelligent shifting from AI to IA. But what is Intelligence? We can define intelligence as the ability to approach a solution by changing our endowment of knowledge. But the question is: by modifying our knowledge endowment does a modification of intelligence result? In our perspective, given that the endowment of knowledge consists of informative units, interpretative schemes and value categories, it follows that if you can have different schemes then you can have intelligence augmentation.

Moreover, a shift from AI to IA means re-defining a Wise System from Smart Systems since AI progress changes the role of human-factors in the socio-technical systems. This means promoting a system in which the optimization process refers to the capability to improve the collaborative intelligence through intelligence augmentation processes.

INtelligence. Augmentation means putting the accent on the role of human resources: in this sense, artificial intelligence goes beyond the boundaries of the mechanical and autopoietic system to become as a "partner" in a cognitive complex system, characterized by machine-human interactions. So, we don't replace man, but we complete it and increase its capacity to

analyze in an extremely short time an enormous amount of data helping us to make the best decisions. The ability to process large amounts of data, identifying correlations and patterns/schemes, allows man to be more performing and more optimizing in his decisional and operational processes.

POSTER TITLE: AI IN RETAIL AND ECOMMERCE

Names and contact info: Stephen Kwan (stephen.kwan@sjsu.edu)

Poster abstract: The poster describes recent trends in retail and eCommerce: vertical integration, horizontal and global expansion, Online to Offline integration, and AI applications to enhance customer experience in both front stage and back stage operations.

POSTER TITLE: OPEN AI VERSUS CLOSED AI-GENERATED APPLICATIONS IN ARCTIC TOURISM

Authors and contact info: Mariluz Soto, Sun Liping, Pia Keränen, Rosa Ballardini, Melanie Sarantou, Satu Miettinen (satu.miettinen@ulapland.fi, University of Lapland)

Poster abstract: The poster will present two test cases developed by students at the University of Lapland, Faculty of Art and Design, where Siri has been used in order to provide services to tourists. The case studies investigated the use of Siri as an AI tool for guiding tourists through Rovaniemi in Arctic Finnish Lapland which is a city with inhospitable weather conditions during the winter months. Siri's practical application for finding information about tourist destinations such as Santa Claus Village, searching transportation options and ordering food during cold winter nights have been investigated. The experiences of both tourist and local citizens were included in the case studies. The aim of the case studies was to highlight the role of service design in investigating, understanding and delivering AI tourism services in the arctic. The findings revealed that AI applications (Siri, Cortana and Google) and other technological tools and platforms, such as websites and social media offer significant opportunities for improving tourism service delivery in the Arctic. The poster will also present and disseminate how open source AI can be used to produce economically valuable and innovative AI-generated outputs. As such, the questions related to possible Intellectual Property Rights (IPR) entitlements on the AI-generated outcomes, pointing to the role of open AI in producing results that might well become proprietary, will be addressed.

POSTER TITLE: DYNAMICAL MULTI-AGENT SYSTEMS: FORMAL VERIFICATION, SYNTHESIS AND STRATEGIC REASONING

Authors and contact info: Riccardo De Masellis (riccardo.demasellis@philosophy.su.se) and Valentin Goranko (valentin.goranko@philosophy.su.se) from Stockholm University

Abstract: Multi-agent systems is a paradigm for describing scenarios where autonomous agents (inter)act in a common environment to pursue individual or collective goals. Being complex networks, social groups and financial markets examples of such systems, their study is of interest for computer science, artificial intelligence and game theory. When agents can evolve their knowledge, change roles/responsibilities and join and leave the environment, we say that the system is dynamical and thus capable to describe even more complex scenarios. Formal verification and strategic reasoning of those systems are logic-based techniques addressing problems such as:

- Networks re-configurability: "When nodes keep connecting and disconnecting, how can the others change their roles/capabilities to keep the network working?"
- Manufacturing and plug-and-produce: "Which kind and how many machines are needed to produce a specific good and how can they cooperate to do so? "
- Protocol synthesis: "It there a strategy for a group of trusted agents to exchange private knowledge by using non-reliable channels or other untrusted agents as relays?"
- Financial markets: "Is it always possible for a group of agents to prevent the others to control the price of a product?"

POSTER TITLE: DEEP LEARNING FOR MULTI-PERSON HUMAN POSE ESTIMATION WITHOUT A PERSON DETECTOR

Authors and contact info: Oguzhan Gencoglu (oguzhan.gencoglu@topdatascience.com), Pauliina Karell (pauliina.karell@topdatascience.com), Quan Nguyen (quan.nguyenminh@topdatascience.com)

Poster abstract: We present a bottom-up approach to detect the 2D pose of multiple people in an image, in an efficient manner. The deep learning architecture jointly learns both the body part locations and the confidence of associations between them in a single training. The approach do not employ a person-detector, therefore the speed performance is independent of the number of people in the image. Our method significantly exceeds the previous state-of-the-art result and has been implemented in TensorFlow in Python.

POSTER TITLE: PRACTICING INNOVATION THROUGH COGNITIVE COMPUTING AND ARTIFICIAL INTELLIGENCE: THE IBM WATSON CASE

Authors and contact info: Marialuisa Marzullo (marialuisa.marzullo@unina.it), Cristina Mele (cristina.mele@unina.it), Tiziana Russo Spena (tiziana.russospena@unina.it)

POSTER TITLE: BIOMEDICAL SIGNAL ANALYSIS TEAM

Authors and contact Info

- Morteza Zabihi (presenter, Morteza.zabihi@tut.fi)
- Ali Bahrami Rad (ali.bahrami.rad@aalto.fi)
- Serkan Kiranyaz (mkiranyaz@qu.edu.qa)
- Aggelos K. Katsaggelos (aggk@eecs.northwestern.edu)
- Moncef Gabbouj (moncef.gabbouj@tut.fi)

Poster abstract: The global demand for interpreting biomedical signals, such as Electroencephalogram (EEG) and Electrocardiogram (ECG) is increasing due to its numerous applications. The main ambition of our team is to study and develop the state-of-the-art methods to interpret the complex behavior of bioelectric signals and provide complementary information to characterize medical status. Our team is working as an international collaboration among Tampere University of Technology and Aalto University, Finland, Northwestern University, USA, and Qatar University, Qatar.

POSTER TITLE: DIGITAL BUSINESS ECOSYSTEM (DBE) CORE CONCEPT

Authors and contact Info

- Tomi Dahlberg (tkmdah@utu.fi),
- Kari Korpela (Kari.Korpela@lut.fi),
- Karri Mikkonen (karri.mikkonen@businessturku.fi)

Poster abstract: The DBE Core concept describes how the data exchange of supply chain data can be automated and integrated at ecosystem level with API, Blockchain (Hyberledger) and Artificial intelligence, and what is the the venue from APIs to AI.

APPENDIX: SHOWCASE YOUR WORK THROUGH A POSTER

Posters, where you print some materials about your work and stick them on a board, are a great way to network, discuss, and share your activities with people who have similar interests. **Please contact me malaika@us.ibm.com by March 2, putting Helsinki poster in the subject line, if you would like to showcase your AI work in a poster on March 13 between 17:30-19:30.** These are the details you should send about your poster:

- Your name and the names & email address any other poster authors
- Poster title
- Poster abstract
- Any relevant references

Poster Boards – Dimensions 120 X 70cm or 47.2 X 27inches

APPENDIX – ROOM CAPACITY

- Auditorium 2nd (180)
- F10-6th (50)
- F5-6th (25)
- 202 -2nd (40) – Classroom style with tables
- 203 – 2nd (30) – Classroom style with tables
- BR1 -1st (20) – Boardroom style with table