Hands-on Workshops for Students

Poznań Supercomputing and Networking Center,
Jana Pawła II 10, 61-139 Poznań, Poland

PRACE days 19

EuroHPC Summit Week

Workshop 1

BIG DATA ANALYSIS WITH R HADOOP

TARGET AUDIENCE: Master students, PhD students, postdoctoral researchers, other students and researchers

BRIEF CONTENTS: Short introductory lecture will cover basic concepts of big data management and analysis using RHadoop. Students will get access to HPC available at ULFME, where all necessary software will be preinstalled. Within this working space they will create, store, load big data files and perform basic statistics above them.

ORGANISERS
Dr. Janez Povh, Dr. Leon Kos, University of Ljubljana

TIME SLOT: Thursday 16 May 2019,
(Room 0.26 A+B), 14:30 – 18:30

PREREQUISITES:
- Basic knowledge of Linux command line
- Basic knowledge of R and statistics;
- Own laptop.

PROGRAMME:
- Introduction to big data and Hadoop (Dr. Janez Povh)
- Connecting to HPC at ULFME and first experiences with it (Dr. Leon Kos)
- Hands-on exercises (Dr. Janez Povh,):
- How to create (retrieve) big data, store it into the distributed file system and load it back;
- How to write and run few simple map-reduce functions for basic big data analyses (computing group centroids, finding the outliers, word count example).

Workshop 2

INTRODUCTION TO SPARK

TARGET AUDIENCE: master students, PhD students, postdoctoral researchers, other students and researchers.

BRIEF CONTENTS: Short introductory lecture, covering basic concepts of Apache Spark Data Analytic Framework. Students will get access to HPC available at UoE, where all necessary software will be preinstalled. Within this working space they will create and start their own Spark cluster, which will be used later for running different jupyter notebooks. These notebooks are intended to train the students on different basic Apache Spark concepts by using the Python language.

ORGANISERS
Dr. Rosa Filgueira, Dr. Amrey Krause

TIME SLOT: Wednesday 15 May 2019,
(Room 0.31 A+ B) 14:30 – 18:30

Prerequisites
- Basic knowledge of Linux and concepts of computational chemistry
- Desktop or Laptop with Linux OS.

Shuttle service from IBB Andersia Hotel to PSNC will be provided after lunch.

WiFi Code at PSNC for guests
SSID: konferencja
Password: af@7E#23
eduroam available

WiFi Code at the Andersia Hotel
SSID: EHPCSW2019
Password: EHPCSW2019PSNC
eduroam available

EuroHPC Joint Undertaking

From **13** to **17 May 2019** | **Poznań**, Poland **#EHPCSW**

Hands-on Workshops for Students

Workshop 3

INTRODUCTION TO MACHINE LEARNING

TARGET AUDIENCE: Anyone interested in Machine Learning

BRIEF CONTENTS: This tutorial is aimed at participants with no previous experience in machine learning with neural networks and deep learning. You will get an understanding of what machine learning can presently can do, how neural networks work and learn about best practices in machine learning. Two types of networks will be covered in some detail: convolutional neural networks (CNN) and recurrent neural networks (RNN). The former is mostly used in image processing tasks, while the latter can be used for natural language processing tasks. You will have the opportunity to explore these models during two hands-on sessions based on notebooks.

- What types of problems can machine learning tackle?
- What is a neural network and how does it work?
- How to train a neural network? Best practices.
- Two case studies with hands-on:
  - image classification using a CNN (convolutional neural network)
  - Text classification using an RNN (recurrent neural network)
- Conclusions

ORGANISERS: Dr. Geert Jan Bex (UHasselt) + support (Flemish Supercomputer Center)

Time Slot
Thursday 16 May 2019, Room 0.26 C, 14:30 – 18:30

PREREQUISITES
- Basic knowledge of Linux command line;
- Own laptop with SSH client installed.

Workshop 4

DEVELOPMENT OF MODERN AUTHENTICATION AND AUTHORIZATION MECHANISMS

TARGET AUDIENCE: Developers of services and applications for HPC, security analysts

BRIEF CONTENTS: Modern authentication and authorization mechanisms 'CTF' (Capture The Flag) workshop, where participants will learn and design auth(z) and auth(N) and in the end... code-in (into a prepared environment):
ORGANISERS: PSNC Cybersecurity Dept. team: Pawel Berus, Gerard Frankowski, Mikołaj Dobski, Paweł Węgrzak

TIME SLOT
Wednesday May 15 2019, Room 0.26 C, 14:30 – 18:30

PREREQUISITES
- Own laptop
- Fluent English
- Basic knowledge of Java
- Running HyperV/VirtualBox
- WiFi

Workshop 5

INTRODUCTION TO HPC COMPUTING

TARGET AUDIENCE: Master students, PhD students, postdoctoral researchers, other students and researchers

BRIEF CONTENTS: Workshop gives a short introduction to the purposes of HPC computing. Overview on basic principles: main components of HPC system, working with queue system. Presentation of how one can exploit potential of a supercomputer with different kinds of parallelism.

ORGANISERS: Radoslaw Januszewski, Maciej Brzezniak

TIME SLOT: Wednesday May 15 2019, Room 0.31AB, 14:30 – 18:30

PREREQUISITES
- Basic knowledge of Linux command line;
- Own laptop with SSH client installed.

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