Dr. Mohammad Alfraheed

Tafila Technical University

Faculty of Communication and Information Technology

Department of Computer Science

General Information

2012

In 2012, I had a Ph.D degree from RWTH-Aachen University which is the one of the best universities in Germany and Europe

2012

In 2012, I hired as assistant professor in Tafila Technical Univerity.

2014

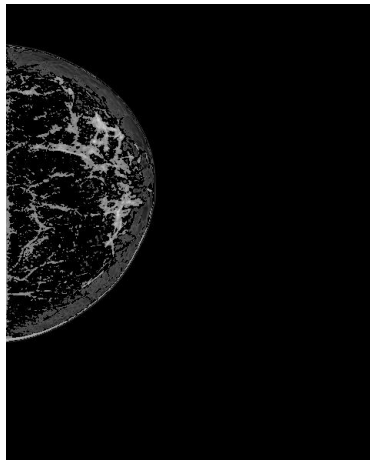
In 2014, I have been selected for the Endeavour Fellowship to do a post-doctorate in university of technology Sydney in Australia for six months. My research was fully funded by the Endeavour Scholarship

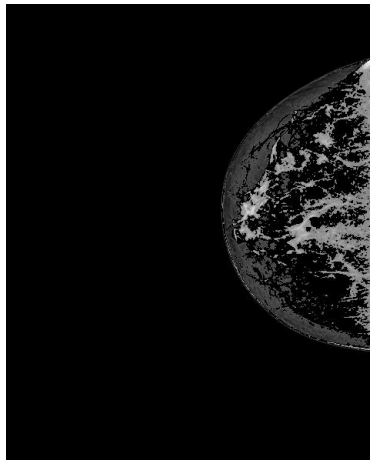
2015

In 2015, I hired as a head of the department of computer science at tafila technnical university

General Information

In 2015, my projects called CCC cancer cell classification has been selected to be funded by Project VI-SEEM which is run in jordan by SESAME





General Information

In 2019, the president of Tafila Technical University hired me beside of as an associated professor to manage the consultations, studies and training center

In 2023, I have been selected for FULBRIGHT SCHOLARSHIP to do again a POST-Doctorate research in University of Michigan-dearborn

FULBRIGHT
فولبرايت
JORDAN

Background Research

My interested research filed is in general in computer science. In more details, I prefer to do research in artificial intelligence and computer vision and image processing

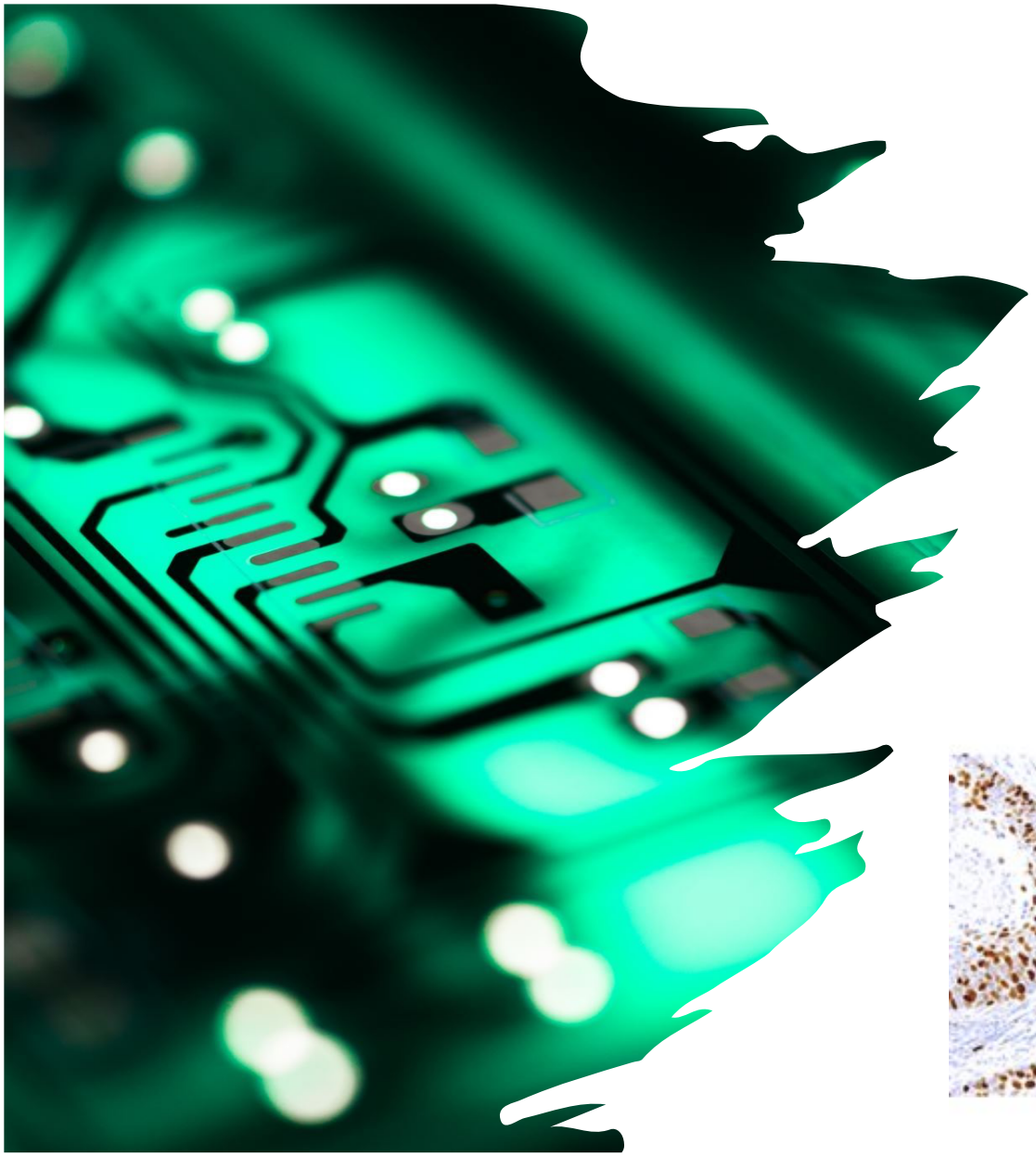
I'd to developed news applications not only in medical applications but also in cyber physical system which is mainly coordinate by computer vision

Future Work

- Two-View Mammogram Synthesis
- Cyber Physical System

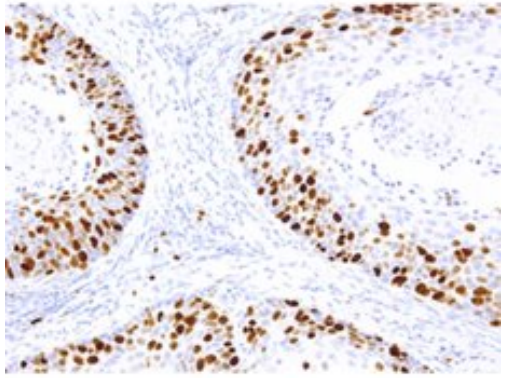
Amro Aljadaa

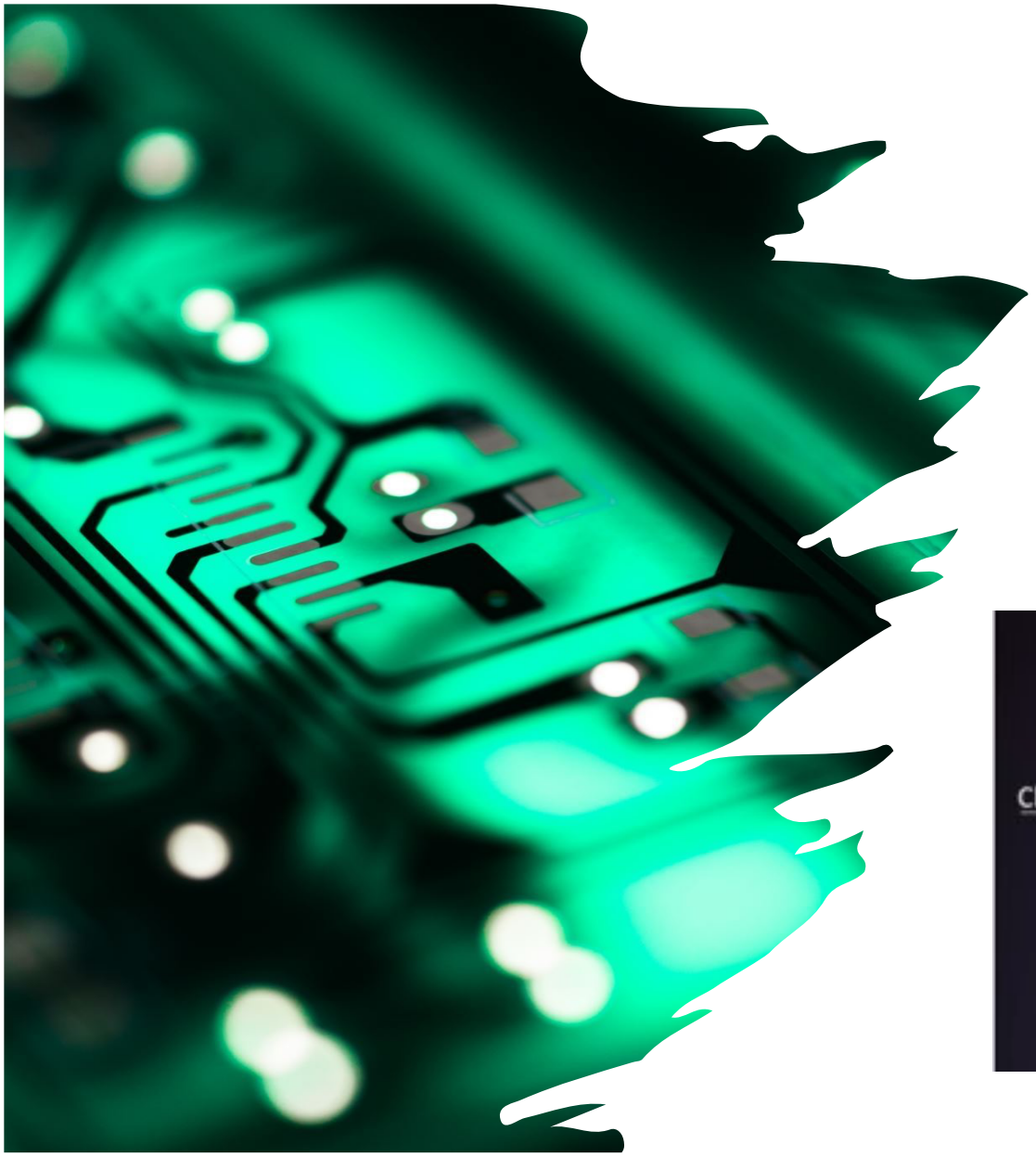
CONTROL SOFTWARE
ENGINEER @SESAME



Background

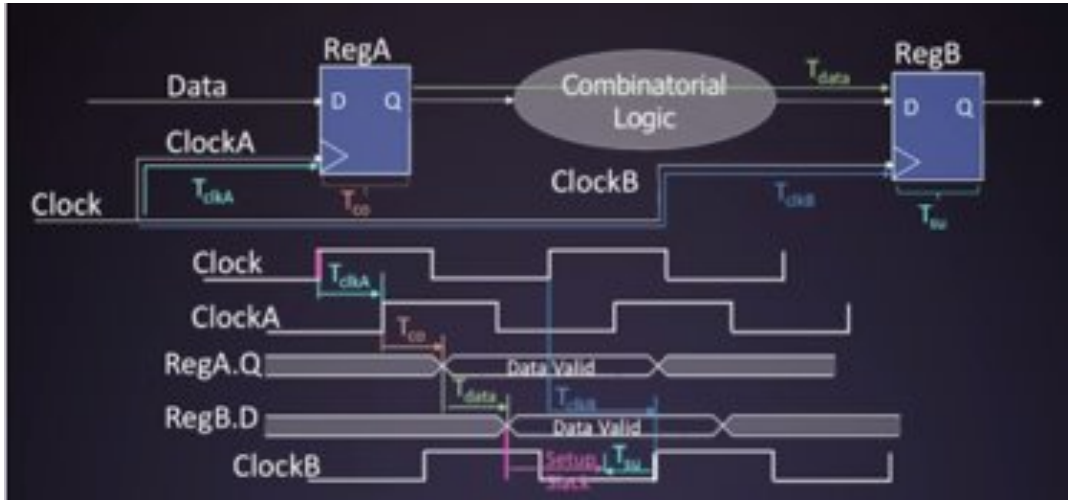
- Electrical Engineering
- Embedded Systems
- Image Processing & AI





Background

- Electronic design automation
- Robotics



SESAME

We use **C++** to:

- Develop graphical user interfaces using Qt
- Develop Drivers for controllers

SESAME

We use **Python** to write scripts that perform various services for the machine, including:

- monitoring machine performance
- Controlling motors
- Image Processing
- Event driven systems

ARM Robot

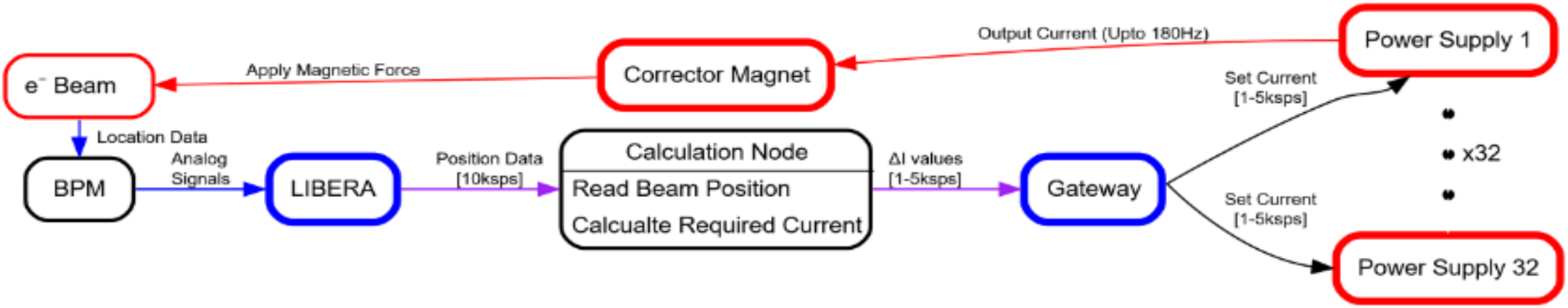
- Sample changing in MS beamline
- State driven control
- Safety features
- Interface the arm with the controller and the sensors

Software Management

- Docker for Containerizing IOCs and GUI projects
  - Eases maintaining and managing them in different environments.
  - This will make the IOCs portable and able to run on any operating system on any machine - with docker installed - without worrying about dependencies and versions.
  - Moving from development to production is very fast.

- CI/CD on the way!

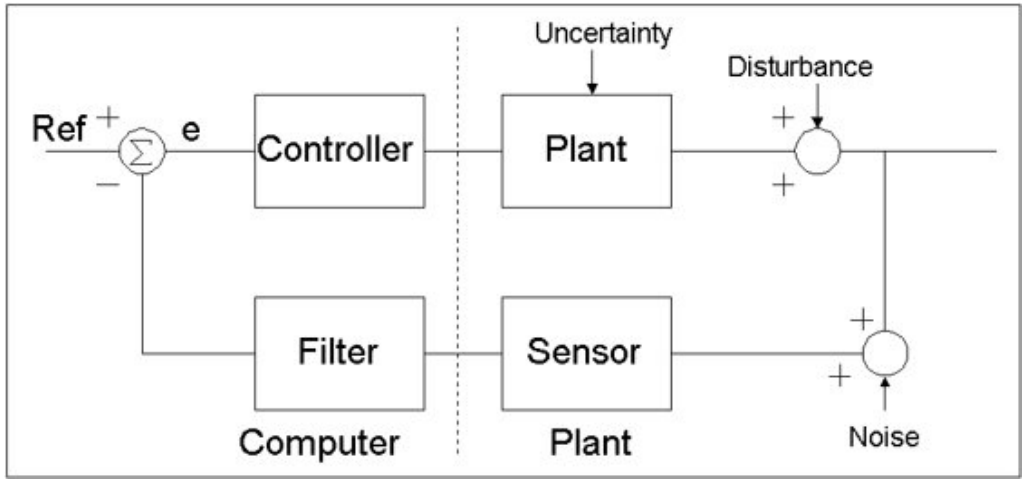
Fast Orbit Feedback

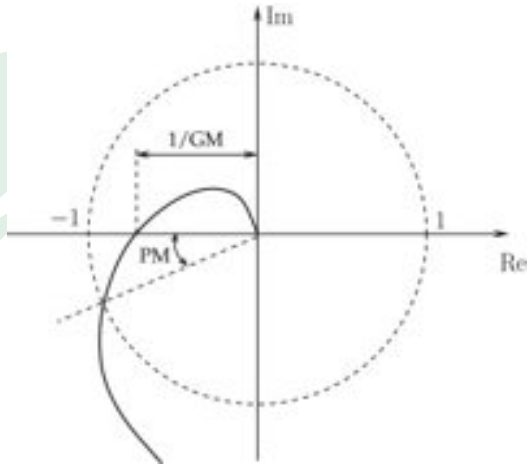


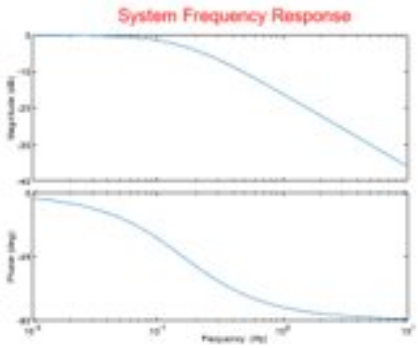
- Correct beam position in the ring

- code in C++ and efficiency is extremely important

Control System Design

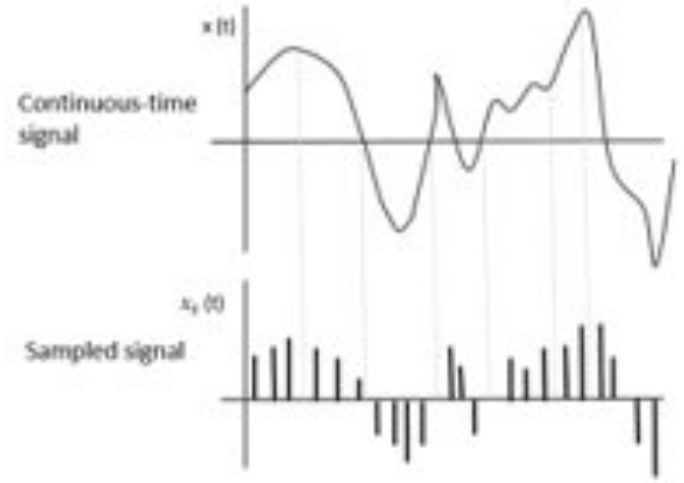






Digital Signal Processing

- Sampling
- Digital filters




Thank You!

Dr. Khalid Jaber

Associate Professor, IEEE Senior Member

E-Learning & Open Educational Resources Center, Director

Faculty of Science and Information Technology
Al-Zaytoonah University of Jordan

Ph.D., Computer Science, 2007-2011

Thesis Topic: **Adapting and Enhancing Decision Tree-Based Method to Index Large DNA-Protein Sequence Data Using Hybrid Distributed-Shared Memory Programming Model**

Khalid Jaber, Rosni Abdullah and Nur'Aini Abdul Rashid. A framework for decision tree-based method to index data from large protein sequence databases, 2010 IEEE EMBS Conference on Biomedical Engineering and Sciences (IECBES 2010), Kuala Lumpur, Malaysia, December, 2010.(Scopus).

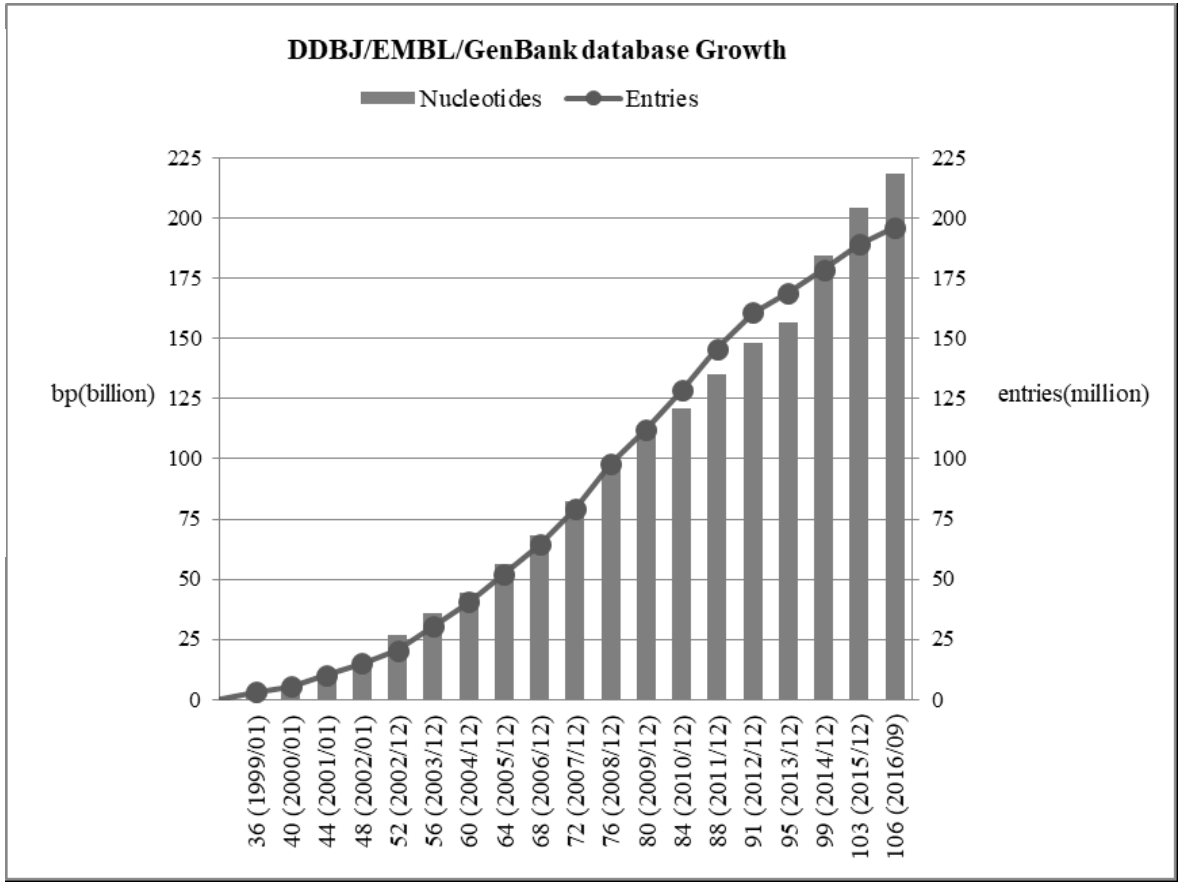
Khalid Jaber, Rosni Abdullah and Nur'Aini Abdul Rashid. Indexing protein sequence/ structure databases using decision tree: A preliminary study, 4th International Symposium on Information Technology 2010 (ITSim 2010), Vol. 2, Kuala Lumpur Convention Center, Kuala Lumpur, Malaysia, pp. 844-849, June, 2010.(Scopus).

Khalid Jaber, Rosni Abdullah and Nur'Aini Abdul Rashid. A survey of data mining techniques, Symposium of USM Fellowship holders 2009, USM, Penang, Malaysia, pp. 844-849, 2009.

Khalid Mohammad Jaber, Rosni Abdullah and Nur'Aini Abdul Rashid. Adapting Decision Tree-Based Method to Index Large DNA-Protein Sequence Datasets. *The Research Bulletin of Jordan ACM*, Volume II, No. III, September 2011, pp. 57-73.

Khalid Mohammad Jaber, Rosni Abdullah and Nur'Aini Abdul Rashid. Adapting and Enhancing the Searching Algorithm Based on Decision Tree Indexing for Large DNA-Protein Datasets. *The 2011 Conference on Innovations in Computing and Engineering Machinery (CICEM'11)- ACM Chapter Conference* , Vol. 2, pp. 113-122, Grand Hyatt Amman Hotel, Amman, Jordan, 5-6 September, 2011.

Khalid Mohammad Jaber, Rosni Abdullah and Nur'Aini Abdul Rashid. Fast Decision Tree-Based Method to Index Large DNA-Protein Sequence Databases Using Hybrid Distributed-Shared Memory Programming Model. *International Journal of Bioinformatics Research and Applications*, Volume 10, No. III, pp. 321-340, 1 January, 2014.(Scopus).



The exponential growth of the DDBJ, EMBL and GenBank from 1999 to 2016

Khalid Mohammad Jaber, Rosni Abdullah and Nur'Aini Abdul Rashid. **HDT-HS: A Hybrid Decision Tree/Harmony Search Algorithm for Biological Datasets**. 2012 International Conference on Computer and Information Sciences, Volume 1, pp. 341 - 345, Kuala Lumpur, Malaysia, 12-14 June 2012, (Scopus).

- Khalid Mohammad Jaber, Sokyna M. Al-Qatawneh, **P-CC-NN: Parallel Cascade Correlation Neural Network Methods for Pattern Recognition applications using Multicore Techniques**, Journal of Theoretical and Applied Information Technology, Vol. 93. No. 1,2016, (ERA and Scopus).
- Sokyna M. Al-Qatawneh, Khalid Mohammad Jaber, **Parallel Cascade Correlation Neural Network Methods for 3D Facial Recognition: A Preliminary Study**, Journal of Computer and Communications, 3, 54-62, 2015.

Khalid Mohammad Jaber, Osama Moh'd Alia and Mohammed Mahmod Shuaib, PHS-SFM: **A Parallel Harmony Search Algorithm for the Reproduction of Experimental Data in the Continuous Microscopic Crowd Dynamic Models**, Journal of Experimental and Theoretical Artificial Intelligence, 05 Jan 2018,30:2, Pages 235-255, (IF: 1.384).

Pilgrimage+Evacuation

Adnan Hnaif, Khalid Mohammad Jaber,Mohammad Alia, and Mohammed Daghbosheh**, Parallel scalable approximate matching algorithm for network intrusion detection systems**, International Arab Journal of Information Technology,2021, 18(1), pp. 77–84, (IF: 0.742).

Sokyna Alqatawneh,Khalid Mohammad Jaber, Mosa Salah, Dalal B. Yehia, Omayma Alqatawneh and Abdulrahman Abulahoum, **Employing of Object Tracking System in Public Surveillance Cameras to Enforce Quarantine and Social Distancing Using Parallel Machine Learning Techniques**, International Journal of Advances in Soft Computing and its Application, 13, 3(2021), 170-180. (Scopus)

FDPA Internet of Things System for Forest Fire Detection, Prediction and Behaviour Analysis

Thank You!
very much!

INFN ESC@SESAME

Data Collection & Analysis Team

Mustafa Alzubi
Data Collection & Analysis Team supervisor

Anas Mohammad*

Anas Mohammad*

Experimental Data Engineer
@SESAME -April 2022-

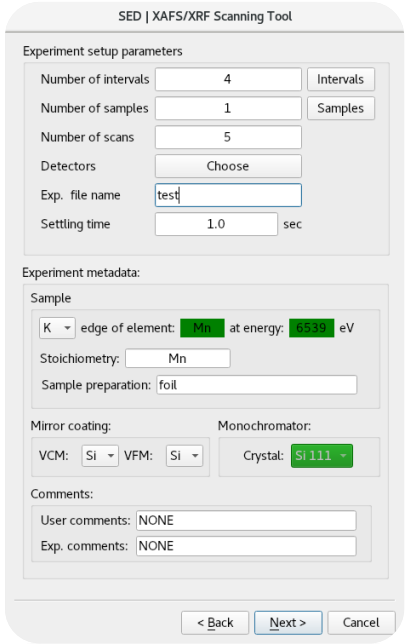
BSc. in Mechatronics Engineering
from ***HU -2021-***

***anas.mohammad@sesame.org.jo**

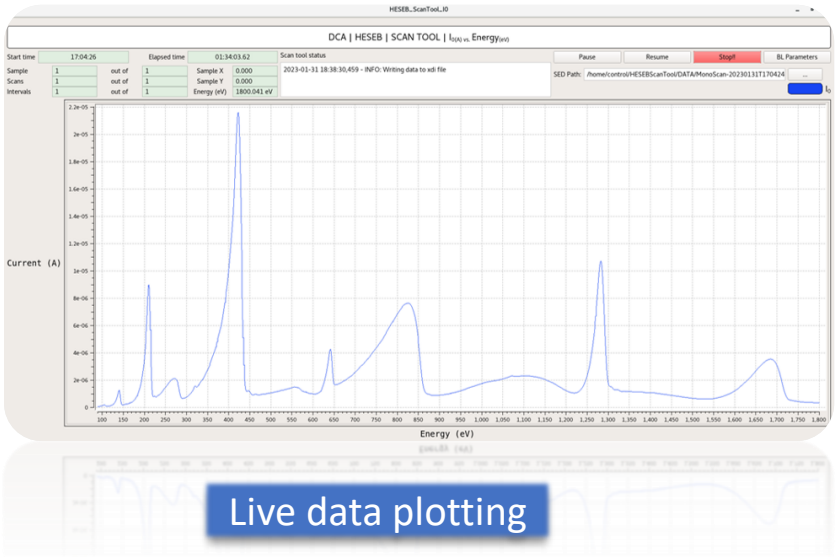
DCA | Mission & Responsibility

Data Collection and Analysis team is:

- responsible for providing the essential pre-processing and post-processing tools that are needed to make the data ready for users and scientists to start their own analysis.



UI scanning tool

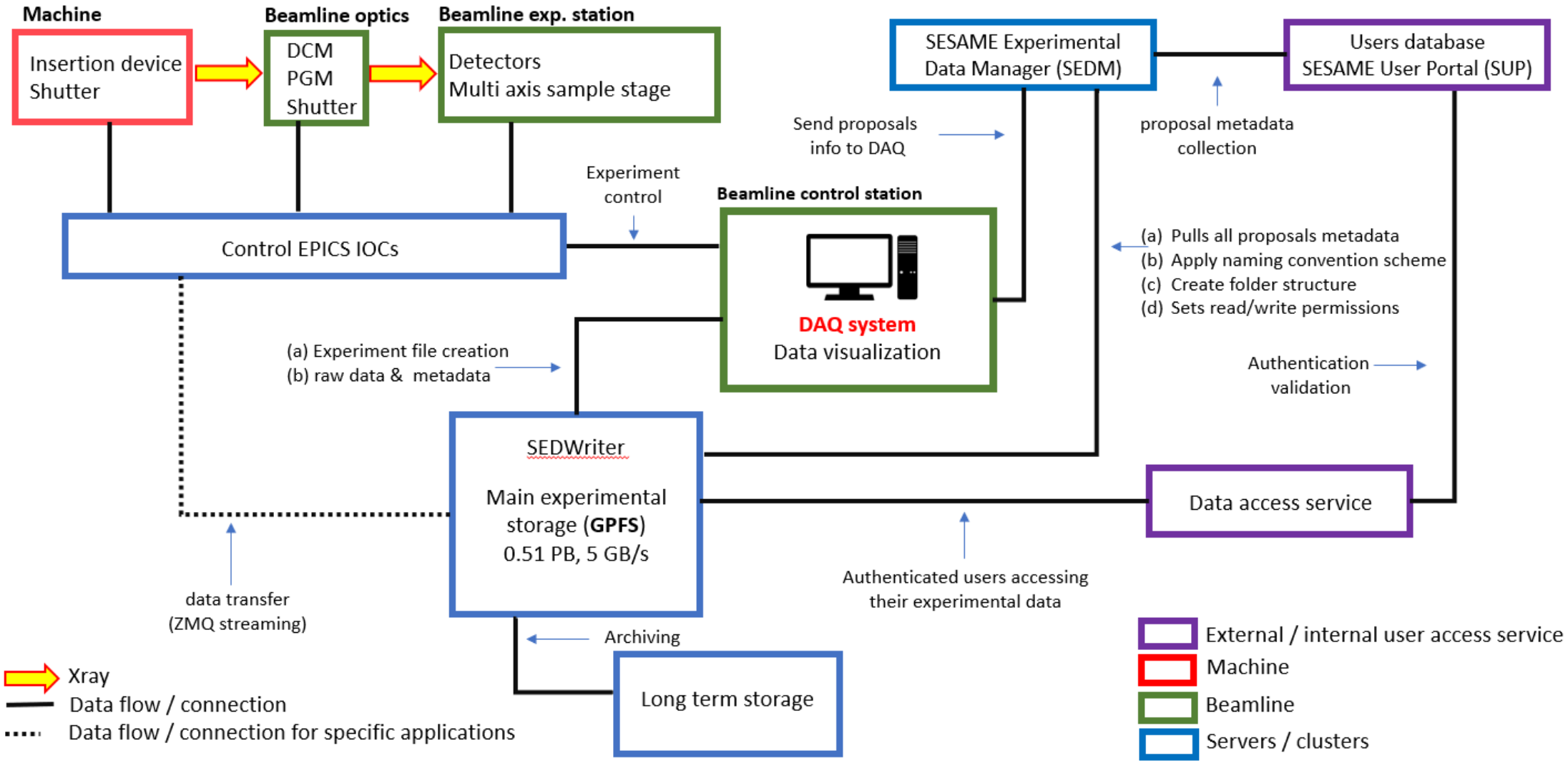


Live data plotting

- mainly responsible for ensuring that the experimental data is not randomly generated by acquiring the experimental data and its metadata from the beamlines and other sources, store them together in a stander and well-defined file formats.

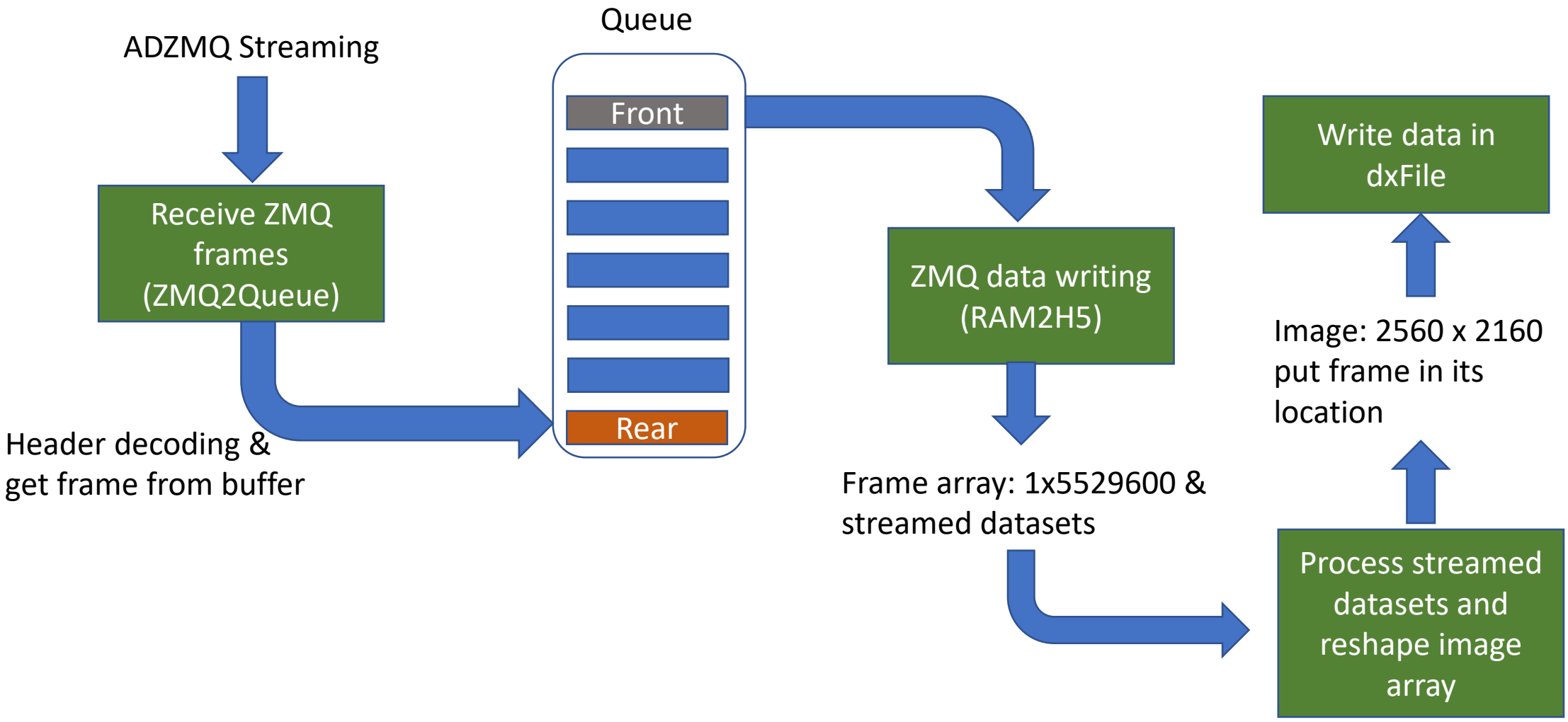
DAQ General Pipeline

The diagram below shows a general layout of the systems and instruments that are needed for obtaining experimental data at SESAME.



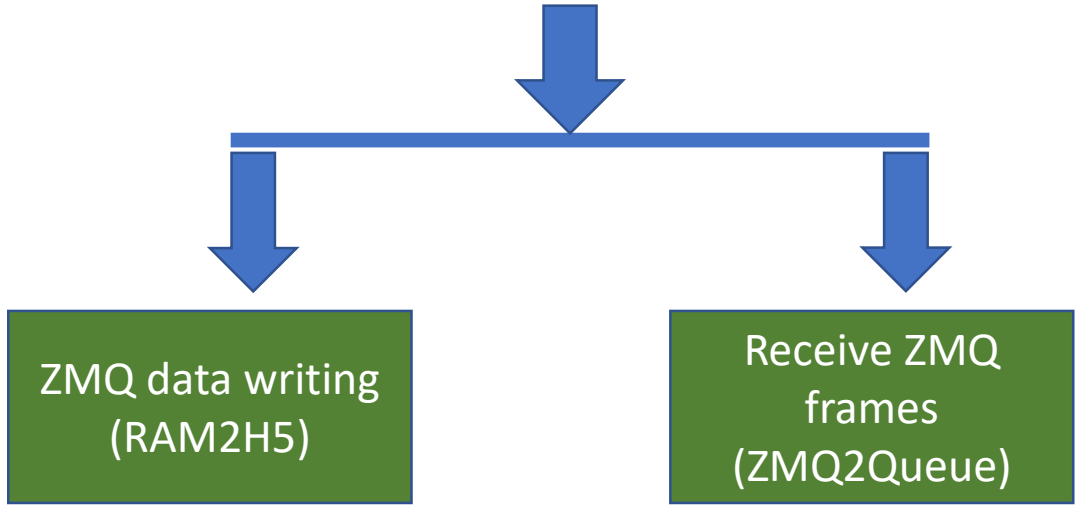
DAQ | Big Data Acquisition System | BEATSWriter

- **BEATSH5Writer:** run the parallel receiving and writing processes



DAQ | Big Data Acquisition System | BEATSWriter

- **BEATSWriter:** Components |run the parallel receiving and writing processes




```
dataQueue = Queue(maxsize=-1) # -1 unlimited queue size
fullH5Path = self.fPath+"/"+self.fName
recevingCounter = Value("i", 0) # Shared integer (i) variables between parallel processes
processingCounter = Value("i", 0) # Shared variable between parrallel proccesses
ZMQ2Queue = Process(name = "ZMQ2Queue",  target=self.ZMQ2Queue, args=((dataQueue),fullH5Path, self.numFrames,
self.frameSizeX, self.frameSizeY, recevingCounter,)) # ZMQ to RAM Proccess
RAM2H5 = Process(name = "ram2h5", target=self.Queue2HDF5, args=((dataQueue), processingCounter,)) # ZMQ to RAM Proccess
ZMQ2Queue.daemon = True # to kill all subprocess when when the process is terminated
self.procStartTime = time.time()
ZMQ2Queue.start() #launch the zmq to queue receiving proccess.
RAM2H5.daemon = True #to kill all subprocess when when the process is terminated
RAM2H5.start() #launch the queue to h5 writing proccess.
```

HPC | BEATS Cluster | CUDA

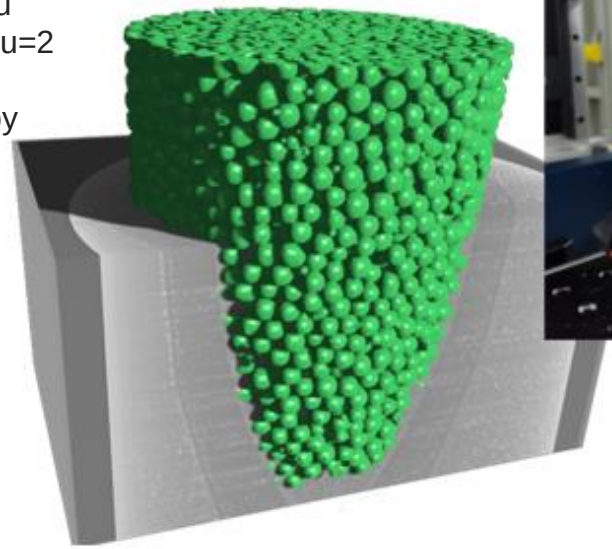
HPC Cluster

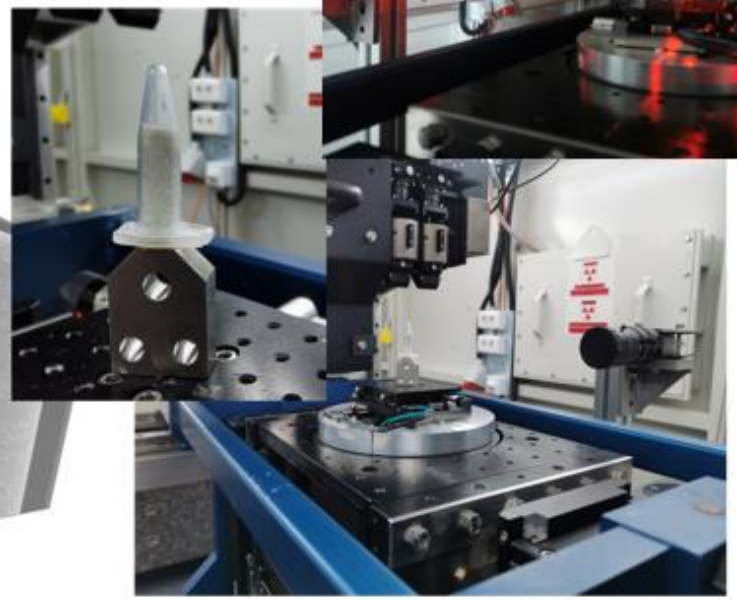

```
#!/bin/bash
#SBATCH --job-name=BEATS_rec_%j
#SBATCH --output=BEATS_rec_%j.out
#SBATCH --error=BEATS_rec_%j.err
#SBATCH --ntasks=48
#SBATCH --cpus-per-task=2
#SBATCH --time=00:30:00
#SBATCH --partition=cpu
#SBATCH --mem-per-cpu=2
# Modules section:
ml load anaconda/tomopy
```

Reconstruction Job

run on GPU node

First 3D tomography images from BEATS





```
python BEATS_recon.py /PETRA/SED/BEATS/IH/glass_speres_coral-20230519T190251/red_sea_coral-20230519T190251.h5 --recon_dir/PETRA/SED/BEATS/IH/tmp/recon --work_dir /PETRA/SED/BEATS/IH/tmp --cor_methodtomopy --ncore 92
```

SESAME-MAXIV Fellowship

31 Oct, 2022 – 30 Dec 2022

Data Acquisition System -More focus on hardware and continuous scan technique

Triggering System | PandABox

PandABox is a fully integrated position, acquisition and control system with GTX-CLK0 up to125MHz.

OnFly Scan | Fast Data Acquisition | MS Beamline

Encoder Readouts

PandABox

TTL triggers

Captured data

Frequency 500Hz

Streamed Big data

Parallel programming C++
Reshaping, Extract ROI from each frame, apply some basic operations

Processed data

Thanks!

Any Question!