MONIKA OBROCKA

Research Data Scientist

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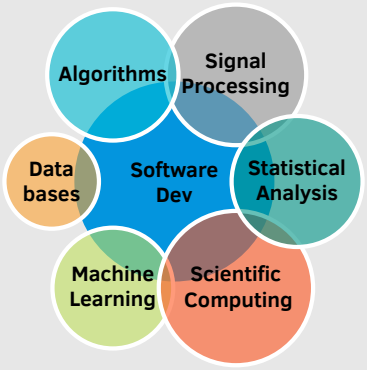
pinsleepe

Skills

Overview



Programming

$0\ LOC$ $50k\ LOC$

Matlab

Python

CWL • C++ • R • SQL

Projects

IBM Research - Africa - Use of machine learning to improve the computational infrastructure of the MeerKAT radio telescope.

SETI Breakthrough Listen - Machine learning and big data techniques to distinguish between terrestrial sources of interference, and potential extraterrestrial signals

TRAPUM - A collaboration that aims to use MeerKAT to reveal numerous new pulsars and fast radio transients

ALMA - Testing performance of the ALMA Band 5 production cartridge

CASPER - Platform-independent, open-source hardware and software for radio astronomy instrumentation

Education

2011 - 2015 **PhD, Radio Astronomy** — **Manchester University, UK**

2007 - 2011 **BEng., Electronic Engineering** — **Aston University, UK**
First Class with placement year

Research

2011 - 2015 **PhD Thesis** — Manchester University

Title: High-time resolution astrophysics using digital beamforming

- Proposed an algorithm to reliably localise a transient radio source without the need for imaging.
- Performed simulations investigating beam patterns, array layouts, beam re-pointing and beam pointing errors, multibeaming capabilities and beamforming algorithms in floating and fixed point.
- Investigated the influence of these effects on the detection rates, validity, and interpretations of the fast transients and their detection with interferometers.
- **Tools**: Matlab, Python, Git, Linux

Experience

Sep 2016 - Present **Research Data Scientist** — **SKA SA**

- Developing of algorithms and software related to dealing with data pipelines and data management
- Developing the advanced radio frequency interference excision and mitigation techniques to allow for the most sensitive observations
- Building a robust RFI detection system, with identification of known sources and flagging of unknown types of signals, anomalies
- Applying machine learning techniques to discover new astrophysics
- **Tools**: Docker, CWL, SQL, Python, Git, Linux

March 2015 Sep 2016 **Digital Signal Processing Engineer** — **SKA SA**

- Architecting the system and designed algorithms in MATLAB with domain expertise in DSP and radio astronomy
- Experience in digital communications protocols and networking on high-speed (100GGbE/S) lab equipment in data center
- Developed on large Xilinx FPGAs
- Documentation generation: requirements, design, interface and test specifications
- **Tools**: Matlab/Simulink, Core9, Python, Git, Linux

Sep 2010 - May 2011 **RF Microwave Engineer** — **STFC RAL Space**

- Designed, fabricated and created an assembly for broadband LNA
- verified components performance characteristics and link budget analysis
- **Tools**: HFSS, ADS, Windows

Sep 2009 - Aug 2010 **Automation Engineer** — **STFC ISIS**

- Designed and built control software to support and automate muon experiments
- Provided programming, troubleshooting, testing/measurement and technical support
- **Tools**: LabView, National Instrument DAQ systems, Windows