Postdoc Position Available at CU Denver NIST PREP Program

NIST Organization (Div/Group): Sources and Detectors Group

This position is part of the National Institute of Standards (NIST) Professional Research Experience (PREP) program. NIST recognizes that its research staff may wish to collaborate with researchers at academic institutions on specific projects of mutual interest, thus requires that such institutions must be the recipient of a PREP award. The PREP program requires staff from a wide range of backgrounds to work on scientific research in many areas. Employees in this position will perform technical work that underpins the scientific research of the collaboration.

Research Title:
Development of Application Benchmarks and Device Metrics for in-Memory Compute

Postdoc Position Description:
Development of metrics and application benchmarks for Daffodil, a new memory device characterization platform being developed at NIST. Daffodil is a versatile test vehicle capable of accommodating all types of two-terminal memory devices for rapid characterization. In collaboration with Western Digital, we have already demonstrated its applicability spin transfer torque magneto-resistive random-access memory (STT-MRAM) technology. While the initial version of Daffodil provided a proof-of-concept demonstration, we are continuing to develop Daffodil into a plug-and-play, open-source analog memory characterization and benchmarking platform that offers a turnkey product suitable for both academic and industrial settings. The candidate will develop metrics and application benchmarks in close collaboration with the engineers working on the hardware platform and with feedback from many industrial and academic groups. The project will involve machine learning and machine learning training, physical device modeling, programming and FPGA programming. The position is based in NIST, Boulder but will also involve travel and collaboration between NIST Boulder and NIST Gaithersburg (2-4 trips per year).

General Duties and Responsibilities:
- Evaluation and synthesis of existing benchmarking tools
- Testing different machine learning training methods for application benchmarks
- Evaluation and implementation of memory device test methods
- Developing physical device models for emerging memory technologies (e.g. ReRAM and MRAM devices)

Qualifications:
- A PhD in Physics, Electrical Engineering, Materials Science, Computer Science, Applied Mathematics, or a related field.
- Familiarity with memory devices and CMOS fabrication.
- Ability to collaborate with many groups, synthesize data and present it in a compelling way.
- Familiarity with multiple scripting languages. Familiarity with Spice, Verilog and/or Cadence a plus.
- Ability to develop prototypes of tools needed to analyze data.
- Strong oral and written communication skills.

NIST Sponsor Name: Sonia Buckley (sonia.buckley@nist.gov)

Level of Appointment: Postdoc

Salary Determination: $78,900 – $85,000

Length of Term:
Start Date: 2024-10-14
End Date: 2027-10-17

For possible consideration and to apply to this position, qualified candidates should send a current CV, including contact information for three references and a publication list, to Professor Hamid Fardi (hamid.fardi@ucdenver.edu).

CU Denver PREP posting:
https://engineering.ucdenver.edu/research/prep-research program