Postdoctoral Researcher (or Ph.D. Student) / Software Engineer
Semiconductor Device Modeling Lab
Department of Electrical Engineering, National Cheng Kung University, Tainan, Taiwan

Job (Research) Description
The Postdoctoral Researcher (or PhD Student) / Software Engineer will leverage expertise in electronic design automation, digital and analog circuit design, and/or deep machine learning to work on the development of a neuromorphic circuit simulation tool, as part of the AI Creative Center initiative administered by Taiwan's Ministry of Science and Technology (MOST). The neuromorphic circuit simulator takes Verilog-A based memory device (e.g. RRAM or FeRAM) compact models and neural network model (e.g. CNN or RNN) as input, and predicts the learning outcome (e.g. energy requirement, computational efficiency, and ML training accuracy) for a given dataset (e.g. MNIST).

Expected Contributions and Job (Research) Responsibilities
- Design the software architecture for the neuromorphic circuit simulation tool.
- Develop code for the neuromorphic circuit simulation tool (preferably in C/C++ or Java).
- Utilize the neuromorphic circuit simulator to make predictions on specific neuromorphic circuit and applications (e.g. using RRAM-based CNN to perform image recognition on handwritten digits in the MNIST database).
- Periodically report results to the AI Creative Center in the form of written reports and/or oral presentations. Occasional travel is necessary.
- Publish results in the form of journal and conference articles or file patents.
- Work with National Center for High-performance Computing (NCHC); integrate neuromorphic software into NCHC's *simPlatform* to support parallel computation.

Reporting structure and Team
- The Postdoctoral Researcher / Software Engineer reports to the principle investigator, Professor Darsen Lu, of MOST project "Neuromorphic Circuit Validation Platform for Biomedical Image Computation," and works closely with co-principle investigator Dr. Nan-Yow Chen and Dr. Wen-Jay Lee of NCHC during the software development process.

Desired Knowledge, Skills and Experiences
- Ph.D. (preferred) or M.S. graduates in electrical engineering or computer science. Industry experience is a plus.
- Strong programming skills in C/C++ or Java; familiar with the Linux/Unix environment; familiar with the basics of algorithms and data structure.
- Experienced in electronic design automation and/or digital and analog circuit design.
- Basic familiarity with deep machine learning and neural networks.
- Highly motivated with the ability to work independently.
- Excellent oral and written communication skills in English and Mandarin Chinese – with ability to communicate with domestic and foreign members within the team.

Compensation and Project Duration
The AI Creative Center initiative allows industry-competitive compensation, which exceeds guidelines provided by NCKU for postdoctoral researchers, subject to the approval of the school's administration. PhD student's compensation, on the other hand, will be subject to MOST's guideline on maximum compensation. The AI Creative Center is scheduled to be completed in 4 years (2018 – 2021).

Please contact Prof. Lu if interested: darsenlu@mail.ncku.edu.tw +886-6-275-7575 #62427

博士後研究員(或博士班學生) / 軟體工程師
半導體元件模型實驗室 (國立成功大學電機工程學系 / 台南市 / 台灣)

工作（研究）概述
博士班學生 / 博士後研究員 / 軟體工程師將善用「積體電路設計自動化」、「數位及類比電路設計」、及「深度機器學習」方面學識，參與科技部 AI 創新研究中心計畫下類神經網路電路模擬軟體之開發。類神經網路模擬軟體以 Verilog-A 記憶體元件（如電阻式記憶體、鐵電記憶體等）模型以及類神經網路架構（如 CNN、RNN 等）作為輸入，預測某特定資料集（如 MNIST 手寫數字資料庫）進行機器學習之效果（如消耗之能量、計算速度、機器學習精確度等）。

工作（研究）內容與職責
- 規畫類神經網路模擬軟體之架構
- 撰寫類神經網路模擬軟體之程式碼（以 C/C++ 或 Java 撰寫尤佳）
- 應用類神經網路模擬軟體對特定神經網路與應用作出預測（例如利用電阻式記憶體構成之 CNN 網路，預測對 MNIST 手寫數字之影像辨識效果）。
- 定期撰寫書面報告，或至 AI 創新研究中心等地作口頭報告。偶爾必須到外縣市出差。
- 將研究成果發表至期刊、會議論文中，或撰寫專利。
- 與國家高速網路中心合作，將軟體整合至中心平行計算平台 simPlatform 中。

所屬團隊
- 博士後研究員 / 軟體工程師隸屬於科技部「應用於生醫影像之類神經電路驗證平台」之計畫主持人盧達生助理教授團隊，並與協同主持人國家高速網路中心陳南佑博士、李玟頡博士密切合作軟體開發。

學歷、工作經驗與專業知識
- 電機工程、資訊工程或相關領域之碩博士畢業生（博士尤佳）。具工業界經驗者優先錄取。
- 具軟體能力與 C/C++ 或 Java 程式設計經驗；熟悉 Linux/Unix 環境；具基本演算法與資料結構相關知識。
- 熟悉「積體電路設計自動化」與「數位及類比電路設計」
- 對深度學習與類神經網路有基本的認識。
- 態度積極，且能獨立完成工作內容。
- 具良好的中英文溝通能力，能與團隊外國與本國人士溝通。

薪資與計畫年限
依科技部 AI 創新研究中心計畫規定，校方得依專業人才市場供需自訂薪資水準，故校方允許下待遇將優於一般博士後研究員。博士班研究生薪資則依科技部上限給予。AI 創新研究中心計畫為期 4 年 (2018 – 2021)。

有意者請聯絡盧達生老師 darsenlu@mail.ncku.edu.tw (06) 275-7575 #62427