Shi Guo

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SUMMARY

7 years of experience in designing, maintaining and testing large-scale C++/Java projects in both scientific research and industry.
5 years of experience of computational physics research focusing on quantum Monte Carlo simulation.
5 years of experience in designing semiconductor testing program in c++/Java. Building and implementing test methodologies(including DC, digital, analog, radio frequency) for different kinds of semiconductor device
4 years of experience of production data analysis using python with scipy, pandas library. Performing statistical tests including ANOVA, t test, F test.
Strong math background in linear algebra, numerical optimization, probability and measure theory, stochastic calculus.
Strong physics background in quantum mechanics and solid state physics.

SKILLS

Programming: C++, Java, Python scripting(Numpy), Matlab, Linux(Bash Script, Vim)
Coursework and Certificate: Coursera Certificate in Machine Learning and Deep Learning, SAS(Regression and Modeling Certificate), Algorithms and Data Structure.

EXPERIENCE

Application Engineer, Advantest America, Inc. July.2013-Now
Developed and delivered system on chip(SoC) test programs for Advantest 93K automated tester platform.

Achievement Highlights

- Developed test methods in C++/java for DC test, digital test, RF(Transmitter/Receiver) test.
- Developed universal test method library for On-Die Parametric test on different TI DSP device, provide device characterization results to R&D.
- Collaborated with application engineers to deliver test program for production.
- Provided on-site pre-sales support for different customers(TI, Broadcom) to trouble-shoot any tester hardware/software related problems.
- Built data analysis tool using python(including scipy, pandas library) to do data analysis.

Research Assistant, Department of Physics, North Carolina State University, Jun.2009-Jun.2013
Conducted computational physics research focusing on electronic structure using quantum Monte Carlo method, developed and maintained computational software code in C++ for 4 years.

Achievement Highlights

- Conducted parallel-computing simulations on supercomputers using first-principles methods(Hartree-Fock, Configuration Interaction, Density Functional Theory).
- Conducted research using Quantum Monte Carlo method to evaluate different physical quantities in various kinds of system(atoms, molecules, solids).
- Maintained quantum Monte Carlo code under Linux-based cluster environment.
- Evaluated the dipole moment of weakly bonded ultracold molecules precisely using Quantum Monte Carlo method and provided the data with good quality to research funding agency.

- Carried out numerical wavefunction optimizations(steep descent, quasi-Newton, etc.) to reduce the data fluctuation.
- Introduced new mathematical models for electron spin and built into the existing algorithm to extend the features of the program to handle spin-dependent systems, designed every class and method independently using C++(10k lines).
- Performed the first successful calculation in literature on relativistic effects of two dimensional electron gas in semiconductor devices.

EDUCATION

- **Ph.D Physics**
  North Carolina State University, Raleigh, NC, USA, Dec.2013 GPA:3.63/4.0
- **B.S. Physics**, **Minor in Economics**
  Shanghai Jiaotong University, Shanghai, China, Jun.2007

PUBLICATION

- **Shi Guo**, Michal Bajdich, Lubos Mitas and Peter J. Reynolds; Study of dipole moments of LiSr and KRb molecules by quantum Monte Carlo methods; Molecular Physics Vol. 111, Iss. 12-13,2013
- Cody A. Melton, Minyi Zhu, **Shi Guo**, Alberto Ambrosetti, Francesco Pederiva, and Lubos Mitas; Spin-orbit interactions in electronic structure quantum Monte Carlo methods; Phys. Rev. A 93, 042502