刘松生

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教育背景

- 中科院上海微系统与信息技术研究所 硕士 2015.03 至今
  硕士论文题目：微流控芯片结果读出系统的研究 指导老师：周洪波、Jeffery Reimers
- 上海大学 物理学 2014.09-2015.03
- 太原理工大学 应用物理学 学士 2009.09-2013.07
  毕业设计题目：基于 Nios II 的 sopc 系统的设计及应用 指导老师：刘芳宇

项目经验

- **液滴数字 PCR 芯片的自动处理识别系统** C/C++ 2015.3-2016.7
  - 针对ddPCR芯片千万量级液滴计数难而搭建的自动扫描、识别平台，负责软硬件设计
  - 图像拼接算法、图像分割和识别算法、分类聚类算法、计算机与模块间的通信等
  - 软件控制平移台在显微镜下自动扫描拍照、拼接与液滴自动识别导出，识别率达99.6%
- **全自动蛋白芯片扫描分析系统** C# 2015.10 至今
  - 根据 ELISA 原理扫描蛋白芯片阵列并拟合光密度与浓度曲线关系，负责软硬件设计
  - 自动识别蛋白点算法、MATLAB 拟合曲线、点阵灰度值噪声去除、平台构建等
  - 自动扫面芯片阵列，识别并提取蛋白点灰度值并拟合关系，软件已经应用到医院中
- **基于 FPGA 闪频仪的液滴微流控观测系统** Verilog 2015.3-2015.12
  - 根据无法观测高通量微液滴而设计闪频仪实时观测液滴，负责闪频仪编程以及实验
  - 用 FPGA 制得频率、相位和占空比空调的闪频仪,可实测液滴频率、速度，已申请专利
- **基于光流法的光电鼠标芯片液滴检测系统** C/C++ 2016.7-至今
  - 光电鼠标能检测出△x 和△y，利用这个性质搭建鼠标芯片液滴检测系统

英语及其他技能

- 良好的英语口头及书面表达能力，CET6；熟练粤语、客家话；
- 熟练使用 C/C++、C#、Verilog、XML、MATLAB 和 Linux 系统，熟悉 Python、SqlServer、Java
- 擅长 Altium Designer、Matlab、AutoCAD、Origin、Labview、Multisim、Adobe 软件等
- 掌握常规的精密测量方法及仪器使用，熟练多种单片机、电路焊接、显微系统、液滴微流控等

科研成果

- 发明专利： 微流控中一种观测微液滴的装置及方法，申请号：201610403838.4
- 刘松生，袁浩均，刘强，等，液滴数字 PCR 芯片结果自动化读出平台的研究（审稿中）

社会活动

- 健身协会会长
- 长宁区道路安全志愿者

获奖情况

- 国家励志奖学金、校三好学生、光电奖学金、全国大学生数学竞赛三等奖
- 专业学习奖学金等

Songsheng Liu

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EDUCATION

- Shanghai Institute of Microsystem and Information Technology Mar. 2015- present
  M.S. study in microdroplets observing system Thesis supervisor: Prof. Hongbo Zhou & Jeffery Reimers
- Shanghai University Physics Sep. 2014-Mar. 2015
- Department of Physics, Taiyuan University of Technology, Taiyuan, China Sep. 2009-Jul. 2013
  B.S. study in Apply Physics Thesis supervisor: Prof. Fangyu Liu

PROJECT EXPERIENCE

- Automatic processing platform for droplet digital PCR chip's result C/C++ Dec. 2014-Jul. 2016
  - Hard to recognize millions of microdroplets in a droplet digital PCR chip manually, built an auto scanning and recognizing platform. In charge of designing hardware and software.
  - Images stitching algorithm, Segmentation and Recognition algorithm, Clustering algorithms, and communication between PC and hardware models
  - Software controls translation stage to move exactly and CCD to take pictures, stitching , recognizing and exporting droplets information, recognizing rate above 99.6%
- Automatic detection and analysis system for protein chip C# Oct. 2015-present
  - Scanning protein chip array, fitting a curve for optical density and concentration on the basis of ELISA workings. In charge of designing hardware and software.
  - Recognizing protein array algorithm, fitting curve with MATLAB and C# software, removing noise of photos' gray value, building the system
  - Scanning chip's array automatically, recognizing and reading protein spot's gray value and fitting relations, analyzing, predicting and exporting.
- Microdroplets monitoring system based on FPGA-based stroboscope Verilog Mar. 2015–Nov. 2016
  - Designed stroboscope system to monitor high-throughput droplets, in charge of coding stroboscope and testing.
  - Used FPGA to make a stroboscope with adjustable frequency, phase and duty， it can measure droplets' frequency and speed simultaneously, this device has applied a patent.
- Microdroplets detecting system based on optical flow C/C++ Jul. 2016–present
  - Built a microdroplets detecting system on the base that mouse chip can detect △x and △y

SKILLS

- Operation Skills: Skilled in microelectronic system and precise measurement, familiar with MCU with different manufacture types, microscopic system and microfluidic system
- Strong C/C++, C#, Verilog, XML, MATLAB programming and Linux system skills, Be familiar with Python, SqlServer and Java; Native speaker of Mandarin, good English in both oral and written
- Software: Altium Designer, Matlab, AutoCAD, Origin, Labview, Multisim and Adobe software etc.

SCIENTIFIC ACHIEVEMENT

- Invention patent: A device and method to monitor microdroplets in microfluidic，application number：201610403838.4
- Songsheng Liu, et al.. Study of automatic reading out platform for droplet digital PCR chip (under review)

HONORS AND AWARDS

- National Encouragement scholarship, Merit Student of School, Optoelectronic Scholarship
- Professional Studies scholarship, third prize of National Undergraduate Mathematic Contest