孙悦

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工作经历

讲师 2023.04 – Present

应用科学学院，澳门理工大学

研究员， 视频人工智能健康行为监控研究组长 2020.06 – 2023.02

视频处理方向,电气工程, 荷兰埃因霍温理工大学（QS 世界排名前 100）

研究内容:

- 基于视频的动物、人体的监控和行为分析
- 先进的时间序列等传感数据分析方法
- 健康应用生理学

项目 AI 负责人：

- 主导荷兰 NWO 项目 – IMAGEN, 协调荷兰埃因霍温理工大学、乌得勒支大学和瓦赫宁根大学与研究机构以及荷兰育种和技术公司、农场和兽医组织以及荷兰动物保护组织的合作。该项目由 NWO-TTW 在 Perspectief 的背景下资助。目标是利用多种信号，监控并改善动物健康及生活状态，以减少食物生产的生态足迹

作为研究生导师:

- 2 名硕士毕业
- 1 名硕士在读；2 名博士在读

教学经历:

- 课程 5LSE0 讲师: 视频压缩和分析技术，电气工程系，埃因霍温理工大学
- 课程 WIAS 课程负责人兼讲师: 图像与视频分析, 授课对象：研究生, 瓦赫宁根大学与研究中心（全球农业第一名）

博士研究员 2016.06 – 2020.06

视频处理方向,电子工程, 荷兰埃因霍温理工大学（QS 世界排名前 100）

- 新生儿重症监护病房（NICU）人工智能算法设计与开发
- 协调大学、医疗中心和行业（TU/e、MMC 和飞利浦）之间的多合作伙伴项目
- 指导硕士毕业项目
- 辅导课程“信号处理基础”（5ESE0）

客座研究员 2016.06 – 2020.06

荷兰皇家飞利浦全球研究院, 荷兰埃因霍温

- 为新生儿重症监护病房（NICU）设计数据管理
- NICU 婴儿非接触式呼吸监测定量分析研究与开发

软件工程师 2014.04 – 2015.10

CIMTEC 影像技术商业化中心, 加拿大安大略省伦敦市

- 为图像引导的活检和外科手术开发应用程序
- 设计和开发优化算法，以最大限度地融合各种模态的信息并最大限度地减少计算机预测错误
- 开发用于临床试验分析的应用程序。使用 C++开发测试软件自动测量软件性能指标
- 医疗器械的系统测试和报告，包括测试计划、测试执行、数据统计分析和测试报告

助理研究员 2011.07 - 2014.05

Robarts 研究所, 加拿大安大略省伦敦市

- 开发和实施图像引导前列腺活检的图像配准方法
- 使用图像分析、数据分析、统计分析方法验证的图像处理（配准/分割）算法
- 支持最终用户，例如放射科医师进行临床应用评估

助教 2011.09 – 2014.04

技能

- 视频和图像处理
- 机器学习
- 深度学习
- 数据和统计分析
- 计算机视觉
- 医学影像
- 医疗设备

语言技能

- 英语：流利
- 中文：母语

加拿大安大略省伦敦西安大略大学电气与计算机工程系

- 指导软件工程学生编程实验（Visual C++）
- 评估学生在作业和实验中的表现

助理研究员 2010.10 - 2011.04

华中科技大学生物医学工程系医学超声实验室，湖北 武汉

- 参与 3D 超声数据可视化和 GUI 开发的软件开发，使用 C++ (MFC)

助理研究员 2008.09 - 2009.10

华中科技大学模式识别与人工智能研究所，湖北 武汉

- 使用信号处理算法，实现基于知识的遥感图像地物识别框架

教育经历

荷兰埃因霍温理工大学，荷兰埃因霍温市 2016.06 – 2020.06

电气工程系博士

- 全额奖学金

西安大略大学，加拿大安大略省伦敦市 2011.09 – 2014.05

生物医学工程系硕士

- 全额奖学金

华中科技大学，湖北省武汉市 2006.09 – 2010.06

生物医学工程系学士

发表文章

- **期刊论文:**
  1. Qinghua Guo, Yue Sun*, Clémence Orsini, J Elizabeth Bolhuis, Jakob de Vlieg, Piter Bijma, Peter H. N. de With. Enhanced camera-based individual pig detection and tracking for smart pig farms. Computers and Electronics in Agriculture, 2023

  2. Shoujun Huo, Yue Sun*, Qinghua Guo, Tao Tan, J. Elizabeth Bolhuis, Piter Bijma, Peter H. N. de With. Double-Camera Fusion System for Animal-Position Awareness in Farming Pens. Foods, 2022

  3. Yue Sun, Jingjing Hu, Wenjin Wang, Min He, Peter H. N. de With. Camera-based discomfort detection using multi-channel attention 3D-CNN for hospitalized infants. Quantitative Imaging in Medicine and Surgery, 2021

  4. Zhang Li, Zheng Zhong, Yang Li, Tianyu Zhang, Liangxin Gao, Dakai Jin, Yue Sun, Xianghua Ye, Li Yu, Zheyu Hu, Jing Xiao, Lingyun Huang, Yuling Tang. From community-acquired pneumonia to COVID-19: a deep learning–based method for quantitative analysis of COVID-19 on thick-section CT scans. European radiology, 2020

  5. Dan Zhang, Fan Huang, Maziyar Khansari, Tos T. J. M. Berendschot, Xiayu Xu, Behdad Dashtbozorg, Yue Sun, Jiong Zhang, Tao Tan. Automatic Corneal Nerve Fiber Segmentation and Geometric Biomarker Quantification. The European Physical Journal Plus, 2020

  6. Yue Sun, Caifeng Shan, Tao Tan, Tong Tong, Wenjin Wang, Arash Pourtaherian, Peter H. N. de With. Detecting Discomfort in Infants through Facial Expressions. Physiological Measurement, 2019

  7. Yue Sun, Wenjin Wang, Xi Long, Mohammed Meftah, Tao Tan, Caifeng Shan, Ronald M. Aarts, Peter H. N. de With. Respiration Monitoring for Premature Neonates in NICU. Applied Sciences, 2019

8. Yue Sun, Caifeng Shan, Tao Tan, Xi Long, Arash Pourtaherian, Svitlana Zinger, Peter H. N. de With. Video-Based Discomfort Detection for Infants. Machine Vision and Applications, 2019

9. Dongsheng Jiang, Weiqiang Dou, Luc Vosters, Xiayu Xu, Yue Sun, Tao Tan. Denoising of 3D Magnetic Resonance Images with Multi-Channel Residual Learning of Convolutional Neural Network. Japanese Journal of Radiology, 2018

10. Zhang Li, Fan Huang, Jiong Zhang, Behdad Dashtbozorg, Samaneh Abbasi-Sureshjani, Yue Sun, Xi Long, Qifeng Yu, Bart ter Haar Romeny, Tao Tan. Multi-Modal and Multi-Vendor Retina Image Registration. Biomed Opt Express, 2018

11. Yue Sun, Wu Qiu, Jing Yuan, Cesare Romagnoli, Aaron Fenster. Three-dimensional Non-Rigid Landmark-Based Magnetic Resonance to Transrectal Ultrasound Registration for Image-Guided Prostate Biopsy. Journal of Medical Imaging 2 (2), 025002, 2015

12. Siavash Khallaghi, C. Antonio Sánchez, Abtin Rasoulian, Yue Sun, Farhad Imani, Amir Khojaste, Orcun Goksel, Cesare Romagnoli, Hamidreza Abdi, Silvia Chang, Parvin Mousavi, Aaron Fenster, Aaron Ward, Sidney Fels, Purang Abolmaesumi. Biomechanically Constrained Surface Registration: Application to MR-TRUS Fusion for Prostate Interventions. **IEEE Transactions on Medical Imaging**, 2015

13. Yue Sun, Jing Yuan, Wu Qiu, Martin Rajchl, Cesare Romagnoli, Aaron Fenster. Three-Dimensional Non-Rigid MR-TRUS Registration Using Dual Optimization. **IEEE Transactions on Medical Imaging**, 2014

14. Wu Qiu, Jing Yuan, Eranga Ukwatta, Yue Sun, Martin Rajchl, Aaron Fenster. Prostate Segmentation: An Efficient Convex Optimization Approach with Axial Symmetry Using 3D TRUS and MR Images. **IEEE Transactions on Medical Imaging**, 2014

15. Wu Qiu, Jing Yuan, Eranga Ukwatta, Yue Sun, Martin Rajchl, Aaron Fenster. Dual Optimization Based Prostate Zonal Segmentation in 3D MR Images. **Medical Image Analysis**, 2014.03

16. Yang, Xin, Mingyue Ding, Liantang Lou, Ming Yuchi, Wu Qiu, Yue Sun. Common carotid artery lumen segmentation in B-mode ultrasound transverse view images. International Journal of Image, Graphics and Signal Processing (IJIGSP) 3(5), 15, 2011

会议论文

- **国际会议 (全文):**

1. Qinghua Guo, Yue Sun, Lan Min, Arjen van Putten, Egbert Frank Knol, Bram Visser, T. Bas Rodenburg, J. Elizabeth Bolhuis, Piter Bijma, and Peter H.N. de With. Video-Based Detection and Tracking with Improved Re-identification Association for Pigs and Laying Hens in Farms. 17th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications. SciTePress, 2022

2. Yue Sun, Deedee Kommers, Tao Tan, Wenjin Wang, Xi Long, Caifeng Shan, Carola van Pul, Ronald M. Aarts, Peter Andriessen, Peter H.N. de With. Automated Discomfort Detection for Premature Infants in NICU Using Time-Frequency Feature-Images and CNNs. SPIE Medical Imaging. Houston, Texas, USA, 2020.02

3. Yue Sun, Deedee Kommers, Wenjin Wang, Rohan Joshi, Caifeng Shan, Tao Tan, Ronald M. Aarts, Carola van Pul, Peter Andriessen, Peter H.N. de With. Automatic and Continuous Discomfort Detection for Premature Infants in a NICU Using Video-Based Motion Analysis. 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Berlin, Germany, 2019.07

4. Bahram Marami, Shahin Sirouspour, Suha Ghoul, Shadi Emami Abarghouei, Yue Sun, Aaron Fenster. Non-rigid MRI-TRUS registration in targeted prostate biopsy. SPIE Medical Imaging. Orlando, Florida, USA, 2015.02

5. Wu Qiu, Martin Rajchl, Fumin Guo, Yue Sun, Eranga Ukwatta, Aaron Fenster, Jing Yuan. 3D Prostate TRUS Segmentation Using Globally Optimized Volume-Preserving Prior. **MICCAI** 2014, LNCS 8673, Boston, MA, USA, 2014.09

6. Yue Sun, Wu Qiu, Cesare Romagnoli, Aaron Fenster. 3D Non-Rigid Surface-Based MR-TRUS Registration for Image-Guided Prostate Biopsy. SPIE Medical Imaging. San Diego, CA, USA, 2014.02

7. Yue Sun, Jing Yuan, Martin Rajchl, Wu Qiu, Cesare Romagnoli, Aaron Fenster. Efficient Convex Optimization Approach to 3D Non-Rigid MR-TRUS Registration. **MICCAI** 2013, LNCS 8149, 195-202, Nagoya, Japan, 2013.09.

8. Wu Qiu, Jing Yuan, Eranga Ukwatta, Yue Sun, Martin Rajchl, Aaron Fenster. Fast Globally Optimal Segmentation of 3D Prostate MRI with Axial Symmetry Prior. **MICCAI** 2013, LNCS 8150, 198-205, Nagoya, Japan, 2013.09

9. Jing Yuan, Eranga Ukwatta, Wu Qiu, Martin Rajchl, Yue Sun, Xue-Cheng Tai, Aaron Fenster. Jointly Segmenting Prostate Zones in 3D MRIs by Globally Optimized Coupled Level-Sets. EMMCVPR 2013, LNCS 8081, 12-25, Lund, Sweden, 2013.08

10. Wu Qiu, Jing Yuan, Eranga Ukwatta, Yue Sun, Martin Rajchl, Aaron Fenster. Efficient 3D Multi-region Prostate MRI Segmentation Using Dual Optimization. Information Processing in Medical Imaging 23rd International Conference, IPMI 2013, LNCS 7917, Asilomar, CA, USA, 2013.07

11. Jing Yuan, Wu Qiu, Eranga Ukwatta, Martin Rajchl, Yue Sun, Aaron Fenster. An Efficient Convex Optimization Approach to 3D Prostate MRI Segmentation with Generic Shape Prior. Prostate MR Image Segmentation Challenge, MICCAI 2012, Nice, France, 2012.10

- **国际会议 (摘要):**
  1. Yue Sun, Deedee Kommers, Wenjin Wang, Rohan Joshi, Caifeng Shan, Tao Tan, Ronald Aarts, Carola van Pul, Peter Andriessen, Peter H.N. de With. Video-Based Discomfort Monitoring for Premature Infants in NICU. 6th IEEE International Symposium on Biomedical Imaging, ISBI. Venice, Italy, 2019.04

  2. Yue Sun, Sveta Zinger, Sidarto Bambang Oetomo, Peter H. N. de With. Video-Based Discomfort Detection for Premature Infants. Medical Image Understanding and Analysis (MIUA). Edinburgh, UK, 2017.07

- **地方会议:**
  1. Yue Sun, Sveta Zinger, Sidarto Bambang Oetomo, Peter H. N. de With. Video-Based Discomfort Detection for Premature Infants. 11th Biomedica Summit. Eindhoven, The Netherlands. 2017.05

  2. Yue Sun, Sveta Zinger, Sidarto Bambang Oetomo, Peter H. N. de With. Video-Based Monitoring and Assessing Discomfort in Premature Infants. 6th Dutch Bio-Medical Engineering Conference. Egmond aan Zee, The Netherlands. 2017.01

  3. Yue Sun, Jing Yuan, Cesare Romagnoli, Aaron Fenster. Three-Dimensional Non-Rigid MR-TRUS Registration Using Duality-Based Optimization Method. Imaging Network Ontario Symposium (ImNO). Toronto, ON, Canada, 2014.03

  4. Wu Qiu, Jing Yuan, Eranga Ukwatta, Yue Sun, Martin Rajchl, Aaron Fenster. Fast

Globally Optimal Segmentation of 3D Prostate MRI with Axial Symmetry Prior. Imaging Network Ontario Symposium (ImNO). Toronto, ON, Canada, 2014.03

5. Yue Sun, Jing Yuan, Cesare Romagnoli, Aaron Fenster. Three-Dimensional MR-TRUS Registration for Image-Guided Prostate Biopsy. Canadian Institutes of Health Research (CIHR) TEAM GRANT & Ontario Institute for Cancer Research (OICR) SMARTER IMAGING PROGRAM - Imaging Applications in Prostate Cancer Workshop. London, ON, Canada, 2013.11

6. Yue Sun, Jing Yuan, Cesare Romagnoli, Aaron Fenster. MR to Ultrasound Registration for Image-Guided Prostate Biopsy. Canadian Organization of Medical Physicists (COMP). Montreal, Quebec, Canada, 2013.09

7. Yue Sun, Jing Yuan, Cesare Romagnoli, Aaron Ward, Aaron Fenster. Magnetic Resonance to Ultrasound Registration for Image-Guided Prostate Biopsy. London Imaging Discovery (LID). London, ON, Canada, 2013.06

8. Yue Sun, Jing Yuan, Cesare Romagnoli, Aaron Fenster. Magnetic Resonance to Ultrasound Registration for Image-Guided Prostate Biopsy. London Health Research Day. London, ON, Canada, 2013.03

9. Yue Sun, Jing Yuan, Cesare Romagnoli, Aaron Fenster. Magnetic Resonance to Ultrasound Registration for Image-Guided Prostate Biopsy. Imaging Network Ontario Symposium (ImNO). Toronto, ON, Canada, 2013.02

10. Yue Sun, Cesare Romagnoli, Aaron Ward, Aaron Fenster. Magnetic Resonance to Ultrasound Registration for Image-Guided Prostate Biopsy. Canadian Institutes of Health Research (CIHR) TEAM GRANT & Ontario Institute for Cancer Research (OICR) SMARTER IMAGING PROGRAM - Imaging Applications in Prostate Cancer Workshop. London, ON, Canada, 2012.11

11. Yue Sun, Cesare Romagnoli, Aaron Ward, Aaron Fenster. Magnetic Resonance to Ultrasound Registration for Image-Guided Prostate Biopsy. London Health Research Day. London, ON, Canada, 2012.03

受邀报告

- **Lecture Series:** 2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC, Berlin, Germany. 2019.07
  Presentation Title: Automatic and continuous discomfort detection for premature infants in a NICU using video-based motion analysis.
- **Lecture Series:** 6th Dutch Bio-Medical Engineering Conference, Egmond aan Zee, The Netherlands. 2017.01
  Presentation Title: Video-Based Monitoring and Assessing Discomfort in Premature Infants.
- **Lecture Series:** Imaging Network Ontario Symposium (ImNO), Toronto, ON, Canada. 2014.03
  Presentation Title: Three-Dimensional Non-Rigid MR-TRUS Registration Using Duality-Based Optimization Method.
- **Lecture Series:** Robarts Research MedIA Series - Medical Image Analysis Modern Optimization Analysis, Algorithms and Clinical Applications, London, ON, Canada. 2013.08
  Presentation Title: Dual-Optimization Method to 3D Prostate MRI-TRUS Deformable Registration.
- **Lecture Series:** Huazhong University of Science and Technology, Wuhan, Hubei, China. 2012.10
  Presentation Title: MR to Ultrasound Registration for Image-Guided Prostate Biopsy.

技术技能

- Python, C/C++, Matlab，VB
- Continuous delivery: GIT
- Latex, Excel

荣誉及获奖经历

- 2019　最佳演讲，荷兰马克西马医学科学会议，荷兰
- 2014　最佳壁报会议荣誉论文奖，The international society for optics and photonics (SPIE) - Medical Imaging, San Diego, CA, 美国
- 2011　研究生奖学金， 西安大略大学， 加拿大
- 2010　优秀本科毕业生， 华中科技大学 (top 5%)