

# SHUQIN DONG

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## RESEARCH INTERESTS

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Biomedical radar system, Signal Processing algorithm, Radar-based Sleep monitoring, Contactless accurate cardiopulmonary activity detection

## EDUCATION

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**National University of Singapore, Singapore** Dec. 2023 - present  
Visiting Ph.D. student at Department of Electrical and Computer Engineering, advised by Prof. [Yongxin Guo](#).

**Shanghai Jiao Tong University, China** Apr. 2021 - Present  
Ph.D. candidate in electronic information, advised by Dr. [Changzhan Gu](#).

**Zhejiang University, China** Sep. 2017 - Mar. 2020  
M.S. in electronic science and technology, advised by Prof. [Lixin Ran](#).

**Xidian University, China** Sep. 2013 - June 2017  
B.S. in electronic information engineering

## RESEARCH EXPERIENCE

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**Doppler Cardiogram Detection** in SJTU and ZJU 2018 - 2021

- Design and develop high-sensitivity and high-linearity millimeter-wave radar sensor system.
- Design linear and robust radar baseband demodulation algorithm.
- Design Doppler cardiogram extraction algorithm.

**Cardiovascular Disease Detection** in SJTU 2021 - Present

- Build vital signs signals datasets detected by radar in clinical environment.
- Develop cardiopulmonary anomaly representation algorithm and analysis models with machine learning algorithm.

**Radar-based Sleep monitoring** in SJTU 2022 - Present

- Build sleep datasets based on radar signals.
- Develop [sleep stages classification](#) and [sleep respiratory disorder detection](#) algorithm with machine learning and deep learning algorithms.

**Audio defect detection** in HUAWEI 2020 - 2021

- Software algorithm engineer in [2012 Lab](#).
- Develop audio defect detection algorithms and install it into automated mobile terminal production equipment to detect defective products.

## GRANTS & AWARDS

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<a href="#">MTT-S Graduate Fellowship</a> for Medical Applications	2023, IEEE MTT-S
National Scholarship (for Ph.D. candidate)	2022, SJTU, China
CICAI 2022 Best Demo Runner-up Award	2022, CICAI
IEEE MTT-S IWS 2023 FLASH Competition Best Paper Award	2023, IEEE MTT-S
<a href="#">IEEE MTT-S IWS 2022 FLASH Competition Best Paper Award</a>	2022, IEEE MTT-S
National Scholarship	2019, ZJU, China
IEEE MTT-S IWS 2018 Student Paper Competition Honorable Mention Award	2018, IEEE MTT-S











## PROFESSIONAL ACTIVITIES

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- **Speaker** for IMS2023 workshop – [Biomedical Radars for Monitoring and Diagnosis of Respiratory and Cardiovascular Diseases](#)

- **Reviewer** for IEEE Journal of Electromagnetics, RF, and Microwaves in Medicine and Biology.
- **Reviewer** for IEEE Transactions on Microwave Theory and Techniques.
- **Reviewer** for IEEE Transactions on Instrument and Measurement.
- **Reviewer** for IEEE Microwave and Wireless Technology Letters.
- **Reviewer** for 2022 IEEE International Microwave Biomedical Conference.
- **Reviewer** for 2022 Asilomar Conference on Signals, Systems, and Computers.

## PUBLICATIONS

- [1] **S. Dong**, L. Wen, Y. Ye, C. Li, C Gu. *A Review on Recent Advancements of Biomedical Radar for Clinical Applications*, Submitted to IEEE Open Journal of Engineering in Medicine and Biology, Jan. 2024. (**Invited paper**)
- [2] **S. Dong**, Y Li, C Gu, J Mao. *Automatic Cardiac Timing Detection Technique with Vectors Analytic Demodulation in Long-term Doppler Cardiogram Sensing*, in IEEE Transactions on Microwave Theory and Techniques, Accepted, Nov 2023.
- [3] **S. Dong**, Y Li, J Lu, Z Zhang, C Gu. *Remote Respiratory Variables Tracking With Biomedical Radar System During Sleep*, in IEEE Internet of Things Journal, Accept, Nov 2023.
- [4] **S. Dong**, Y Li, J Lu, Z Zhang, C Gu, J Mao. *Accurate detection of Doppler cardiograms with a parameterized respiratory filter technique using a K-band radar sensor*, in IEEE Transactions on Microwave Theory and Techniques, 2022. 
- [5] **S. Dong**, Y Zhang, C Ma, C Zhu, Z Gu, Q Lv, B Zhang, C Li, L Ran. *Doppler cardiogram: A remote detection of human heart activities*, in IEEE Transactions on Microwave Theory and Techniques, 2019. 
- [6] **S. Dong**, L Wen, Z Zhang, C Gu, J Mao. *Contactless measurement of human systolic time intervals based on Doppler cardiograms in clinical environment*, in IEEE Microwave and Wireless Components Letters, 2022.(selected as **Top50 Papers** of 2022 IEEE International Microwave Symposium, converted to MWCL) 
- [7] Li Wen, **S. Dong**, Yi Wang, Changzhan Gu\*, Zheng Tang, Zhiwei Liu, Junfa Mao. *Noncontact Infant Apnea Detection for Hypoxia Prevention with a K-band Biomedical Radar*, in IEEE Transactions on Biomedical Engineering, 2023.
- [8] Y. Zhang, **S. Dong**, C Zhu, M Balle, B Zhang, L Ran. *Hand gesture recognition for smart devices by classifying deterministic Doppler signals*, in IEEE Transactions on Microwave Theory and Techniques, 2020. 
- [9] W. Xu, **S. Dong**, C Gu, J Mao. *A Novel Calibration-Free Motion Sensing Technique With Single-Channel Interferometric Radars*, in IEEE Transactions on Microwave Theory and Techniques, 2022. 
- [10] Z Chen, W Xu, **S. Dong**, R Ma, C Gu, X Zhang. *Radar Sensing of Displacement Motions With High Robustness Against Additive Noise*, in IEEE Transactions on Microwave Theory and Techniques, 2023. 
- [11] **S. Dong**, J Lu, Y Chen, C Gu, J Mao, et al. *Accurate Fast Heartrate Detection based on Fourier Bessel Series Expansion Technique During Radar-based Sleep Monitor*, in IEEE/MTT-S International Microwave Symposium (**IMS**), 2023. 
- [12] **S. Dong**, Z Zhang, Y Li, J Lu, H Wu, C Gu, J Mao. *COVID-SENSE: Radar-Based Remote Respiratory Disorder Detection in Clinical Environment*, in IEEE MTT-S International Wireless Symposium (**IWS**). 2023. (**FLASH Competition Best Paper Award**) 
- [13] **S. Dong**, L Wen, C Gu, J Mao. *Contactless Detection for Heart Sounds Based on Doppler Radar Sensor*, in IEEE MTT-S International Wireless Symposium (**IWS**). 2022. (**FLASH Competition Best Paper Award**) 
- [14] **S. Dong**, C Gu, J Mao. *Contactless Cardiac RR Intervals Estimation in Radar-Based Cardiogram Detection*, in 56th Asilomar Conference on Signals, Systems, and Computers (**Asilomar**). 2022. (**Finalist of Best Student Paper Competition**) 

- [15] S. Dong, C Gu, X Yang. *Contactless Cardiogram Reconstruction Based on the Wavelet Transform via Continuous-Wave Radar*, in Second CAAI International Conference (CICAI). 2022. (**Best Demo Runner-up Award**)[📄](#)
- [16] W. Li, S. Dong, Z Zhang, C Gu, J Mao. *Noninvasive continuous blood pressure monitoring based on wearable radar sensor with preliminary clinical validation*, in IEEE/MTT-S International Microwave Symposium (IMS). 2022. [📄](#)
- [17] S. Dong, C Gu, L Ran, JF Mao. *Doppler cardiogram detection in the presence of respiration with a K-band radar sensor*, in IEEE Radio and Wireless Symposium (RWS). 2022. [📄](#)
- [18] S. Dong, Y Zhang, C Ma, Q Lv, C Li, L Ran. *Cardiogram detection with a millimeter-wave radar sensor*, in IEEE Radio and Wireless Symposium (RWS). 2020. (**Finalist of Best Student Paper Competition**)[📄](#)

## SKILLS

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- **Tools:** Matlab(★★★), Python(★★☆), C++(★★☆), Cadence(★★☆), HFSS(★★☆), Altium designer(★★☆).