

Peter Charlton

Publication List

Journal Articles

Preprints

- i. X. Liu, J. Zhang, S. Zhou, T. L. van der Plas, A. Vijayaraghavan, A. Grishina, M. Zhuang, D. Schofield, C. Tomlinson, Y. Wang, R. Li, L. van Zeeland, S. Tabakhi, C. Demeocq, X. Li, A. Das, O. Timmerman, T. Baldwin-McDonald, J. Wu, P. Bai, Z. A. Sahili, O. Alwazzan, T. N. Do, M. N. I. Suvon, A. Wang, L. Cipolina-Kun, L. A. Moretti, L. Farndale, N. Jain, N. Efremova, Y. Ge, M. Varela, H.-K. Lam, O. Celiktutan, B. R. Evans, A. Coca-Castro, H. Wu, Z. S. Abdallah, C. Chen, V. Danchev, N. Tkachenko, L. Lu, T. Zhu, G. G. Slabaugh, R. K. Moore, W. K. Cheung, **P. H. Charlton**, and H. Lu. Towards deployment-centric multimodal ai beyond vision and language. *arXiv*, page 2504.03603, 2025. URL <https://doi.org/10.48550/arXiv.2504.03603>
- ii. S. Y. Ho, Z. Ding, D. C. Wong, F. Kristof, J. Brimicombe, M. R. Cowie, A. Dymond, H. C. Clair Linden, G. Y. Lip, K. Williams, J. Mant, and **P.H. Charlton**. Accurate RR-interval extraction from single-lead, telehealth electrocardiogram signals. *medRxiv*, 2025. URL <https://doi.org/10.1101/2025.03.10.25323655>
- iii. M. Moulaeifard, L. Coquelin, M. Rinkevičius, A. Sološenko, O. Pfeffer, C. Bench, N. Hegemann, S. Vardanega, M. Nandi, J. Alastruey, C. Heiss, V. Marozas, A. Thompson, P. J. Aston, **P. H. Charlton**, and N. Strodthoff. Machine-learning for photoplethysmography analysis: Benchmarking feature, image, and signal-based approaches. *arXiv*, 2025. URL <https://doi.org/10.48550/arXiv.2502.19949>
- iv. M. Moulaeifard, **P. H. Charlton**, and N. Strodthoff. Generalizable deep learning for photoplethysmography-based blood pressure estimation – a benchmarking study. *arXiv*, 2025. URL <https://doi.org/10.48550/arXiv.2502.19167>
- v. V. Penmetcha, L. Rambabu, B. Smith, O. Mantle, T. Edmiston, L. Hobbs, S. Nagraj, **P. H. Charlton**, and T. Bashford. Evaluating diversity in open photoplethysmography (PPG) datasets: a protocol for systematic review. *JMIR Preprints*, 2025. URL <http://doi.org/10.2196/preprints.73040>

2025

1. **P. H. Charlton**, V. Marozas, E. Mejia-Mejia, P. Kyriacou, and J. Mant. Determinants of photoplethysmography signal quality at the wrist. *PLOS Digital Health*, 4(6):e0000585, 2025. URL <https://doi.org/10.1371/journal.pdig.0000585>
2. R. Modi, E. Massou, **Peter H Charlton**, A. Dymond, K. Williams, J. Brimicombe, B. Freedman, S. J. Griffin, F. D. R. Hobbs, G. Y. H. Lip, R. J. McManus, and J. Mant. Screening for atrial fibrillation with or without general practice involvement: a controlled study. *BMC Primary Care*, 26(1):185, 2025. URL <https://doi.org/10.1186/s12875-025-02878-y>
3. **P. H. Charlton**, E. J. Arguello-Prada, J. Mant, and P. Kyriacou. The MSPTDfast photoplethysmography beat detection algorithm: design, benchmarking, and open-source distribution. *Physiological Measurement*, 46:035002, 2025. URL <https://doi.org/10.1088/1361-6579/adb89e>
4. A. Sen, M. Aguirre, **P. H. Charlton**, L. Navarro, S. Avril, and J. Alastruey. Machine learning-based pulse wave analysis for classification of circle of willis topology: an in silico study with 30,618 virtual

subjects. *Biomedical Signal Processing and Control*, 100:106999, 2025. URL <https://doi.org/10.1016/j.bspc.2024.106999>

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5. K. P. Bhayankaram, J. Mant, J. Brimicombe, A. Dymond, K. Williams, and **P. H. Charlton**. Telephone training to improve ECG quality in remote screening for atrial fibrillation. *Physiological Measurement*, 45:125005, 2024. URL <https://doi.org/10.1088/1361-6579/ad9798>
6. S. Zanelli, D. Agnoletti, J. Alastruey, J. Allen, E. Bianchini, V. Bikia, P. Boutouyrie, R. M. Bruno, R. Climie, D. Djamaledine, E. Gkaliagkousi, A. Giudici, K. Gopcevic, A. Grillo, A. Guala, B. Hametner, J. Joseph, P. Karimpour, V. Kodithuwakku, P. A. Kyriacou, A. Lazaridis, M. T. Lonnebakken, M. R. Martina, P. M. Mayer, C. C. Nabeel, P. Navickas, J. Nemcsik, S. Orter, C. Park, T. Pereira, G. Pucci, A. B. A. Rey, P. Salvi, A. C. G. Seabra, U. Seeland, T. van Sloten, B. Spronck, G. Stansby, I. Steens, T. Stieglitz, I. Tan, D. Veerasingam, S. Wassertheurer, T. Weber, B. E. Westerhof, and **P. H. Charlton**. Developing technologies to assess vascular ageing: a roadmap from VascAgeNet. *Physiological Measurement*, 45:121001, 2024. URL <https://doi.org/10.1088/1361-6579/ad548e>
7. K. Kario, B. Williams, N. Tomitani, R. J. McManus, A. E. Schutte, A. Avolio, D. Shimbo, J.-G. Wang, N. A. Khan, D. S. Picone, I. Tan, **P. H. Charlton**, M. Satoh, K. N. Mmopi, J. P. Lopez-Lopez, T. L. Bothe, E. Bianchini, B. Bhandari, J. Lopez-Rivera, F. J. Charchar, M. Tomaszewski, and G. Stergiou. Innovations in blood pressure measurement and reporting technology: International Society of Hypertension position paper endorsed by the World Hypertension League, European Society of Hypertension, Asian Pacific Society of Hypertension, and Latin American Society of Hypertension. *Journal of Hypertension*, 42(11):1874, Nov. 2024. URL <https://doi.org/10.1097/HJH.0000000000003827>
8. M. Rinkevicius, J. Lazaro, E. Gil, P. Laguna, **P. H. Charlton**, R. Bailon, and V. Marozas. Obstructive sleep apnea characterization: A multimodal cross-recurrence-based approach for investigating atrial fibrillation. *IEEE Journal of Biomedical and Health Informatics*, 28(10):6155–6167, 2024. URL <https://doi.org/10.1109/JBHI.2024.3428845>
9. F. Kristof, M. Kapsecker, L. Nissen, J. Brimicombe, M. Cowie, Z. Ding, A. Dymond, S. Jonas, H. C. Linden, G. Lip, K. Williams, J. Mant, and **P. H. Charlton**. QRS detection in single-lead, telehealth electrocardiogram signals: benchmarking open-source algorithms. *PLOS Digital Health*, 3(8):e0000538, 2024. URL <https://doi.org/10.1371/journal.pdig.0000538>
10. K. Hibbitt, J. Brimicombe, M. Cowie, A. Dymond, B. Freedman, S. J. Griffin, F. R. Hobbs, H. C. Linden, G. Lip, J. Mant, R. J. McManus, M. Pandiaraja, K. Williams, and **P. H. Charlton**. Reliability of single-lead electrocardiogram interpretation to detect atrial fibrillation: insights from the SAFER Feasibility Study. *EP Europace*, 26:euae181, 2024. URL <https://doi.org/10.1093/europace/euae181>
11. G. Yang, Y. Kang, **P. H. Charlton**, P. Kyriacou, K. Kim, L. Li, and C. Park. Energy-efficient PPG-based respiratory rate estimation using spiking neural networks. *Sensors*, 24:3980, 2024. URL <https://doi.org/10.3390/s24123980>
12. J. Mant, R. N. Modi, **P. H. Charlton**, A. Dymond, E. Massou, J. Brimicombe, B. Freedman, S. J. Griffin, F. D. R. Hobbs, G. Y. H. Lip, R. J. McManus, and K. Williams. The feasibility of population screening for paroxysmal atrial fibrillation using hand-held electrocardiogram devices. *EP Europace*, 26:euae056, 2024. URL <https://doi.org/10.1093/europace/euae056>
13. M. A. Goda, **P. H. Charlton**, and J. A. Behar. pyPPG: A python toolbox for comprehensive photoplethysmography signal analysis. *Physiological Measurement*, 45:045001, 2024. URL <https://doi.org/10.1088/1361-6579/ad33a2>

14. A. Mathieu, M. Pascual, **P. H. Charlton**, M. Volovaya, J. Venton, P. Aston, M. Nandi, and J. Alastruey. Advanced waveform analysis of the photoplethysmogram signal using complementary signal processing techniques for extraction of biomarkers of cardiovascular function. *JRSM Cardiovascular Disease*, 13:1–12, 2024. URL <https://doi.org/10.1177/20480040231225384>
15. C. Pettit, **Peter H Charlton**, and P. Aston. Photoplethysmogram beat detection using symmetric projection attractor reconstruction. *Frontiers in Physiology*, 15:1228439, 2024. URL <https://doi.org/10.3389/fphys.2024.1228439>
16. E. Bianchini, R. E. Climie, C. C. Mayer, M. R. Martina, M. Nandi, A. Schmidt-Trucksass, P. Segers, C. Park, G. Pucci, D. Terentes-Printzios, and **Peter H. Charlton**. Unified language for knowledge dissemination: the vascular ageing glossary, an initiative by VascAgeNet. *Artery Research*, 2024. URL <https://doi.org/10.1007/s44200-023-00041-5>

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17. J. Hong, M. Nandi, **P. H. Charlton**., and J. Alastruey. Non-invasive haemodynamic indices of vascular ageing: An in silico assessment. *American Journal of Physiology-Heart and Circulatory Physiology*, 325:H1290–H1303, 2023. URL <https://doi.org/10.1152/ajpheart.00454.2023>
18. S. Zanelli, K. Eveilleau, **P. H. Charlton**, M. Ammi, M. Hallab, and M. EL Yacoubi. Clustered photoplethysmogram pulse wave shapes and their associations with clinical data. *Frontiers in Physiology*, 14:1176753, 2023. URL <https://doi.org/10.3389/fphys.2023.1176753>
19. **P. H. Charlton**, J. Allen, R. Bailon, S. Baker, J. A. Behar, F. Chen, G. D. Clifford, D. A. Clifton, H. J. Davies, C. Ding, X. Ding, J. Dunn, M. Elgendi, M. Ferdoushi, D. Franklin, E. Gil, M. F. Hassan, J. Hernesniemi, X. Hu, N. Ji, Y. Khan, S. Kontaxis, I. Korhonen, P. A. Kyriacou, P. Laguna, J. Lazaro, C. Lee, J. Levy, Y. Li, C. Liu, J. Liu, L. Lu, D. P. Mandic, V. Marozas, E. Mejia-Mejia, R. Mukkamala, M. Nitzan, T. Pereira, C. C. Y. Poon, J. C. Ramella-Roman, H. Saarinen, M. M. H. Shandhi, H. Shin, G. Stansby, T. Tamura, A. Vehkaoja, W. K. Wang, Y.-T. Zhang, N. Zhao, D. Zheng, and T. Zhu. The 2023 wearable photoplethysmography roadmap. *Physiological Measurement*, 44:111001, 2023. URL <http://iopscience.iop.org/article/10.1088/1361-6579/acead2>
20. R. E. Climie, J. Alastruey, C. C. Mayer, A. Schwarz, A. Laucyte-Cibulskiene, J. Voicehovska, E. Bianchini, R.-M. Bruno, **P. H. Charlton**, A. Grillo, A. Guala, M. Hallab, B. Hametner, P. Jankowski, K. Konigstein, A. Lebedeva, I. Mozos, G. Pucci, H. Puzantian, D. Terentes-Printzios, G. Yetik-Anacak, C. Park, P. M. Nilsson, T. Weber, and on behalf of the VascAgeNet Education and Dissemination Working Group. Vascular ageing: moving from bench towards bedside. *European Journal of Preventive Cardiology*, 11:1101–1117, 2023. URL <https://doi.org/10.1093/eurjpc/zwad028>
21. R. Al-Halawani, **P. H. Charlton**, M. Qassem, and P. A. Kyriacou. A review of the effect of skin pigmentation on pulse oximeter accuracy. *Physiological Measurement*, 44:05TR01, 2023. URL <https://doi.org/10.1088/1361-6579/acd51a>
22. M. Rinkevicius, **P. H. Charlton**., R. Bailon, and V. Marozas. Influence of photoplethysmogram signal quality on pulse arrival time during polysomnography. *Sensors*, 23(4):2220, 2023. URL <https://doi.org/10.3390/s23042220>
23. T. Hygrel, F. Viberg, E. Dahlberg, **P. H. Charlton**, K. Kemp Gudmundsdottir, J. Mant, J. L. Harnlund, and E. Svennberg. An artificial intelligence-based model for prediction of atrial fibrillation from single-lead sinus rhythm electrocardiograms facilitating screening. *EP Europace*, 25(4):1332–1338, 2023. URL <https://doi.org/10.1093/europace/euad036>
24. J. Alastruey, **P. H. Charlton**., V. Bikia, B. Paliakaite, B. Hametner, R. M. Bruno, M. P. Mulder, S. Venin, S. Piskin, A. W. Khir, A. Guala, C. C. Mayer, J. Mynard, A. D. Hughes, P. Segers, and B. E. Westerhof. Arterial pulse wave modeling and analysis for vascular age studies: a review from VascAgeNet. *American Journal of Physiology-Heart and Circulatory Physiology*, 325:H1–H29, 2023. URL <https://doi.org/10.1152/ajpheart.00705.2022>

25. K. Kotzen, **P. H. Charlton.**, S. Salabi, L. Amar, A. Landesberg, and J. A. Behar. SleepPPG-Net: A deep learning algorithm for robust sleep staging from continuous photoplethysmography. *IEEE Journal of Biomedical and Health Informatics*, 27(2):924–932, 2023. URL <https://doi.org/10.1109/JBHI.2022.3225363>

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26. **P. H. Charlton.**, K. Kotzen, E. Mejia-Mejia, P. J. Aston, K. Budidha, J. Mant, C. Pettit, J. A. Behar, and P. A. Kyriacou. Detecting beats in the photoplethysmogram: benchmarking open-source algorithms. *Physiological Measurement*, 43(8):085007, 2022. URL <https://doi.org/10.1088/1361-6579/ac826d>
27. S. Vennin, Y. Li, J. Mariscal-Harana, **P. H. Charlton.**, H. Fok, H. Gu, P. Chowienczyk, and J. Alastruey. Novel pressure wave separation analysis for cardiovascular function assessment highlights major role of aortic root. *IEEE Transactions on Biomedical Engineering*, 69(5):1707–1716, 2022. URL <https://doi.org/10.1109/TBME.2021.3127799>
28. **P. H. Charlton.**, K. Pilt, and P. A. Kyriacou. Establishing best practices in photoplethysmography signal acquisition and processing. *Physiological Measurement*, 43(5):050301, 2022. URL <https://doi.org/10.1088/1361-6579/ac6cc4>
29. P. A. Kyriacou, **P. H. Charlton.**, R. Al-halawani, and K. H. Shelley. Inaccuracy of pulse oximetry with dark skin pigmentation: clinical implications and need for improvement. *British Journal of Anaesthesia*, 130(1):E33–E36, 2023. URL <https://doi.org/10.1016/j.bja.2022.03.011>
30. **P. H. Charlton.**, P. A. Kyriacou, J. Mant, V. Marozas, P. Chowienczyk, and J. Alastruey. Wearable photoplethysmography for cardiovascular monitoring. *Proceedings of the IEEE*, 110(3):355–381, 2022. URL <https://doi.org/10.1109/JPR0C.2022.3149785>
31. **P. H. Charlton.**, B. Paliakaite, K. Pilt, M. Bachler, S. Zanelli, D. Kulin, J. Allen, M. Hallab, E. Bianchini, C. C. Mayer, D. Terentes-Printzios, V. Dittrich, B. Hametner, D. Veerasingam, D. Žikić, and V. Marozas. Assessing hemodynamics from the photoplethysmogram to gain insights into vascular age: a review from VascAgeNet. *American Journal of Physiology-Heart and Circulatory Physiology*, 322(4):H493–H522, 2022. URL <https://doi.org/10.1152/ajpheart.00392.2021>

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33. V. Bikia, T. Fong, R. E. Climie, R.-M. Bruno, B. Hametner, C. Mayer, D. Terentes-Printzios, and **P. H. Charlton.** Leveraging the potential of machine learning for assessing vascular ageing: state-of-the-art and future research. *European Heart Journal - Digital Health*, 2(4):676–690, 2021. URL <https://doi.org/10.1093/ehjdh/ztab089>
34. A. Adami, R. Boostani, F. Marzbanrad, and **P. H. Charlton.** A new framework to estimate breathing rate from electrocardiogram, photoplethysmogram, and blood pressure signals. *IEEE Access*, 9:45832–45844, 2021. URL <https://doi.org/10.1109/ACCESS.2021.3066166>
35. **P. H. Charlton.**, T. Bonnici, L. Tarassenko, D. A. Clifton, R. Beale, P. J. Watkinson, and J. Alastruey. An impedance pneumography signal quality index: Design, assessment and application to respiratory rate monitoring. *Biomedical Signal Processing and Control*, 65:102339, 2021. URL <https://doi.org/10.1016/j.bspc.2020.102339>

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37. P. Celka, **P. H. Charlton.**, B. Farukh, P. Chowienczyk, and J. Alastruey. Influence of mental stress on the pulse wave features of photoplethysmograms. *Healthcare Technology Letters*, 7(1):7–12, 2020. URL <https://doi.org/10.1049/htl.2019.0001>

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39. **P. H. Charlton.**, J. Mariscal Harana, S. Vennin, Y. Li, P. Chowienczyk, and J. Alastruey. Modeling arterial pulse waves in healthy aging: a database for in silico evaluation of hemodynamics and pulse wave indexes. *American Journal of Physiology-Heart and Circulatory Physiology*, 317(5):H1062–H1085, 2019. URL <https://doi.org/10.1152/ajpheart.00218.2019>

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44. M. A. F. Pimentel, A. E. W. Johnson, **P. H. Charlton.**, D. Birrenkott, P. J. Watkinson, L. Tarassenko, and D. A. Clifton. Toward a robust estimation of respiratory rate from pulse oximeters. *IEEE Transactions on Biomedical Engineering*, 64(8):1914–1923, 2017. URL <https://doi.org/10.1109/TBME.2016.2613124>
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50. R. Charlton and **P. H. Charlton**. A medical classic: Liza of Lambeth. *Clinical Medicine*, 12(4):393–4, 2012. URL <https://doi.org/10.7861/clinmedicine.12-4-393>

Book Chapters**2022**

51. E. Mejía-Mejía, J. Allen, K. Budidha, C. El-Hajj, P. A. Kyriacou, and **P. H. Charlton**. Photoplethysmography signal processing and synthesis. In P. Kyriacou and J. Allen, editors, *Photoplethysmography*, chapter 4, pages 69–146. Elsevier, 1st editio edition, 2022. URL <https://doi.org/10.1016/B978-0-12-823374-0.00015-3>
52. **P. H. Charlton**. and V. Marozas. Wearable photoplethysmography devices. In P. Kyriacou and J. Allen, editors, *Photoplethysmography*, chapter 12, pages 401–439. Elsevier, 1st editio edition, 2022. URL <https://doi.org/10.1016/B978-0-12-823374-0.00011-6>

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54. **P. H. Charlton**., M. Pimentel, and S. Lokhandwala. Data fusion techniques for early warning of clinical deterioration. In *Secondary Analysis of Electronic Health Records*, pages 325–338. Springer International Publishing, 2016. URL https://doi.org/10.1007/978-3-319-43742-2_22

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Conference Papers

2024

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