Stanford

Narayan Schuetz

Postdoctoral Scholar, Pulmonary and Critical Care Medicine

Bio

BIO

While studying for his master's degree in bioinformatics, Dr Schuetz (Schütz in german) worked part-time as a nursing assistant, which sparked his deep desire to help improve healthcare using modern technologies. Based on this experience, his general interests lie at the intersection between digital health and AI/ML applied to improve healthcare, particularly related to remote patient monitoring. Before coming to California, he was a data scientist for a digital health startup at EPFL in Switzerland, where he worked, amongst other things, on translating algorithms from his Ph.D. into a production-level cloud environment and coordinated the launch of a digital health technologies enhanced study with multiple hospitals and Roche Pharmaceuticals. Before his industry stay, Narayan obtained a Ph.D. in Biomedical Engineering at the ARTORG Center for Biomedical Engineering Research in Bern, Switzerland. Narayan's award-winning Ph.D. thesis focused on remote patient monitoring in older adults and people with neurodegenerative diseases to assess health states and detect signs of health deterioration early on, establishing him as a pioneer in this nascent field. Before and during his Ph.D., Narayan also worked as a Software Engineer, leading a small agile team in successfully building a novel cross-platform telerehabilitation software system for patients with aphasia, that is currently used in the clinic.

Professional Experience:

2022 - 2023, Data Scientist, domo.health SA, Switzerland

2016 - 2021, Software Engineer (part-time), ARTORG Center for Biomedical Engineering Research, Switzerland

2014 - 2016, Nursing Assistant (part-time), Senevita AG, Switzerland

2011 - 2019, Medic, Swiss Armed Forces, Switzerland

HONORS AND AWARDS

- Vontobel Award for Research on Age(ing) - $17k, University of Zurich/ Vontobel Stiftung (2023)
- Preis für Alternsforschung - $11k, Seniorenunveristät Bern (2022)
- StrongAge Young Investigator Award - $5k, StrongAge (2022)
- Best PhD Thesis Award - $1k, Competence Center for Medical Technology (CCMT) & University of Bern (2022)
- Best Poster Award - $2k, Alumni MedBern (2019)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, IEEE (2019 - present)

PROFESSIONAL EDUCATION

- PhD (summa cum laude), ARTORG Center for Biomedical Engineering Research, University of Bern, Bern, Switzerland , Biomedical Engineering (2022)
- MSc (insigni cum laude), University of Bern and Freiburg , Bioinformatics and Computational Biology (2016)

STANFORD ADVISORS

- Ehsan Adeli, Postdoctoral Research Mentor

- Vinicio de Jesus Perez, Postdoctoral Faculty Sponsor

PATENTS

- Narayan Schuetz, Angela Botros, Philipp Buluschek, Guillaume DuPasquier, Michael Single, Stephan Gerber, Tobias Nef. "Switzerland Patent WO2022168064A1 ASYNCHRONOUS INTERCORRELATED TIME SERIES DATASETS ALIGNMENT METHOD", DomoHealth SA

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

I am a postdoctoral digital health researcher at Stanford University working on remote patient monitoring technologies. This includes Apple Watch based digital

6-Minute Walk Test assessments, large-scale smartphone data from the MyHeart Counts study, and next-generation walk assessments using computer vision and

mmWave technologies.

Publications

PUBLICATIONS

- **A systems approach towards remote health-monitoring in older adults: Introducing a zero-interaction digital exhaust.** *NPJ digital medicine*
  Schütz, N., Knobel, S. E., Botros, A., Single, M., Pais, B., Santschi, V., Gatica-Perez, D., Buluschek, P., Urwyler, P., Gerber, S. M., Müri, R. M., Mosimann, U. P., Saner, et al
  2022; 5 (1): 116

- **A Sensor-Driven Visit Detection System in Older Adults' Homes: Towards Digital Late-Life Depression Marker Extraction.** *IEEE journal of biomedical and health informatics*
  Schutz, N., Botros, A., Hassen, S. B., Saner, H., Buluschek, P., Urwyler, P., Pais, B., Santschi, V., Gatica-Perez, D., Muri, R. M., Nef, T.
  2022; 26 (4): 1560-1569

- **Contactless Sleep Monitoring for Early Detection of Health Deteriorations in Community-Dwelling Older Adults: Exploratory Study.** *JMIR mHealth and uHealth*
  Schütz, N., Saner, H., Botros, A., Pais, B., Santschi, V., Buluschek, P., Gatica-Perez, D., Urwyler, P., Müri, R. M., Nef, T.
  2021; 9 (6): e24666

- **Potential of Ambient Sensor Systems for Early Detection of Health Problems in Older Adults** *FRONTIERS IN CARDIOVASCULAR MEDICINE*
  Saner, H., Schutz, N., Botros, A., Urwyler, P., Buluschek, P., du Pasquier, G., Nef, T.
  2020; 7: 110

- **Long-Term Home-Monitoring Sensor Technology in Patients with Parkinson's Disease-Acceptance and Adherence** *SENSORS*
  Botros, A., Schutz, N., Camenzind, M., Urwyler, P., Bolliger, D., Vanbellingen, T., Kistler, R., Bohlhalter, S., Muri, R. M., Mosimann, U. P., Nef, T.
  2019; 19 (23)

- **Search and Match Task: Development of a Taskified Match-3 Puzzle Game to Assess and Practice Visual Search** *JMIR SERIOUS GAMES*
  Chesham, A., Gerber, S., Schutz, N., Saner, H., Gutbrod, K., Muri, R., Nef, T., Urwyler, P.
  2019; 7 (2): e13620

- **Development of an Open-source and Lightweight Sensor Recording Software System for Conducting Biomedical Research: Technical Report** *JMIR FORMATIVE RESEARCH*
  Single, M., Bruhin, L. C., Schuetz, N., Naef, A. C., Hegi, H., Reuse, P., Schindler, K. A., Krack, P., Wiest, R., Chan, A., Nef, T., Gerber, S. M.
  2023; 7: e43092

- **Eigenbehaviour as an Indicator of Cognitive Abilities.** *Sensors (Basel, Switzerland)*
  Botros, A. A., Schuetz, N., Röcke, C., Weibel, R., Martin, M., Müri, R. M., Nef, T.
  2022; 22 (7)

- **An Instrumented Apartment to Monitor Human Behavior: A Pilot Case Study in the NeuroTec Loft** *SENSORS*

Gerber, S. M., Single, M., Knobel, S. J., Schutz, N., Bruhin, L. C., Botros, A., Naef, A. C., Schindler, K. A., Nef, T.

2022; 22 (4)

- **Contactless Gait Assessment in Home-like Environments** *SENSORS*

  Botros, A., Gyger, N., Schutz, N., Single, M., Nef, T., Gerber, S. M.

  2021; 21 (18)

- **Case Report: Ambient Sensor Signals as Digital Biomarkers for Early Signs of Heart Failure Decompensation** *FRONTIERS IN CARDIOVASCULAR MEDICINE*

  Saner, H., Schuetz, N., Buluschek, P., Du Pasquier, G., Ribaudo, G., Urwyler, P., Nef, T.

  2021; 8: 617682

- **Wearable Based Calibration of Contactless In-home Motion Sensors for Physical Activity Monitoring in Community-Dwelling Older Adults** *FRONTIERS IN DIGITAL HEALTH*

  Schutz, N., Saner, H., Botros, A., Buluschek, P., Urwyler, P., Muri, R. M., Nef, T.

  2021; 2: 566595

- **Trainable Spectrally Initializable Matrix Transformations in Convolutional Neural Networks**

  Alberti, M., Botros, A., Schuetz, N., Ingold, R., Liwicki, M., Seuret, M., IEEE COMP SOC

  IEEE COMPUTER SOC.2021: 8204-8211

- **Contact-free sensor signals as a new digital biomarker for cardiovascular disease: chances and challenges** *EUROPEAN HEART JOURNAL - DIGITAL HEALTH*

  Saner, H., Knobel, S., Schuetz, N., Nef, T.

  2020; 1 (1): 30-39

- **Evaluation of 1-Year in-Home Monitoring Technology by Home-Dwelling Older Adults, Family Caregivers, and Nurses** *FRONTIERS IN PUBLIC HEALTH*

  Pais, B., Buluschek, P., DuPasquier, G., Nef, T., Schuetz, N., Saner, H., Gatica-Perez, D., Santschi, V.

  2020; 8: 518957

- **Real-World Consumer-Grade Sensor Signal Alignment Procedure Applied to High-Noise ECG to BCG Signal Synchronization.** *Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Annual International Conference*

  Schutz, N., Botros, A. A., Knobel, S. E., Saner, H., Buluschek, P., Nef, T.

  2020; 2020: 5858-5962

- **Development and Evaluation of Maze-Like Puzzle Games to Assess Cognitive and Motor Function in Aging and Neurodegenerative Diseases.** *Frontiers in aging neuroscience*

  Nef, T., Chesham, A., Schütz, N., Botros, A. A., Vanbellingen, T., Burgunder, J. M., Müllner, J., Martin Müri, R., Urwyler, P.

  2020; 12: 87

- **A Simple Two-Dimensional Location Embedding for Passive Infrared Motion-Sensing based Home Monitoring Applications**

  Botros, A. A., Schuetz, N., Saner, H., Buluschek, P., Nef, T., IEEE

  IEEE.2020: 5826-5830

- **Isometric Strength Measures are Superior to the Timed Up and Go Test for Fall Prediction in Older Adults: Results from a Prospective Cohort Study** *CLINICAL INTERVENTIONS IN AGING*

  Valenzuela, P. L., Maffiuletti, N. A., Saner, H., Schutz, N., Rudin, B., Nef, T., Urwyler, P.

  2020; 15: 2001-2008

- **A comparative study of pattern recognition algorithms for predicting the inpatient mortality risk using routine laboratory measurements** *ARTIFICIAL INTELLIGENCE REVIEW*

  Schutz, N., Leichtle, A. B., Riesen, K.

  2019; 52 (4): 2559-2573

- **De nouvelles technologies au service du maintien a domicile des personnes agees.** *Revue medicale suisse*

  Pais, B., Buluschek, P., Nef, T., Schutz, N., Saner, H., Gatica, D., Santschi, V.

  2019; 15 (658): 1407-1411

- **Validity of pervasive computing based continuous physical activity assessment in community-dwelling old and oldest-old.** *Scientific reports*

  Schütz, N., Saner, H., Rudin, B., Botros, A., Pais, B., Santschi, V., Buluschek, P., Gatica-Perez, D., Urwyler, P., Marchal-Crespo, L., Müri, R. M., Nef, T.

  2019; 9 (1): 9662

- **Therapist-Guided Tablet-Based Telerehabilitation for Patients With Aphasia: Proof-of-Concept and Usability Study.** *JMIR rehabilitation and assistive technologies*

  Gerber, S. M., Schutz, N., Uslu, A. S., Schmidt, N., Rothlisberger, C., Wyss, P., Perny, S., Wyss, C., Koenig-Bruhin, M., Urwyler, P., Nyffeler, T., Marchal-Crespo, L., Mosimann, et al

  2019; 6 (1): e13163

- **Accuracy and Calibration of Computational Approaches for Inpatient Mortality Predictive Modeling** *PLOS ONE*

  Nakas, C. T., Schutz, N., Werners, M., Leichtle, A. B.

  2016; 11 (7): e0159046