Stanford

Henk van Voorst

Postdoctoral Scholar, Radiology

Bio

BIO

Dr. van Voorst is a postdoctoral scholar in Radiology studying the interfaces of artificial intelligence and neuroradiological imaging in stroke. Originally educated as an MD, Dr. van Voorst gained additional degrees in Finance and Data Science. As a PhD student, Dr. van Voorst focused on cost-effectiveness modeling and developed machine learning and deep learning algorithms with applications in acute ischemic stroke imaging. In his current research, Dr. van Voorst develops artificial intelligence algorithms to automatically extract information from arteries and veins in radiological stroke imaging.

PROFESSIONAL EDUCATION

- Doctor of Philosophy, University of Amsterdam (2023)
- Bachelor of Science, University of Amsterdam (2018)
- Master of Science, Vrije Universiteit Amsterdam (2018)
- Master of Science, Universiteit Utrecht (2018)
- Bachelor of Science, Vrije Universiteit Amsterdam (2013)
- MSc, Vrije Universiteit, Amsterdam , Medicine (2018)
- MSc, Universiteit Utrecht , Banking and Finance (2018)
- MSc, Universiteit van Amsterdam , MSc Information studies: Data Science track (graduated with honors) (2018)
- BSc, Vrije Universiteit, Amsterdam , Medicine (2013)

STANFORD ADVISORS

- Jeremy Heit, Postdoctoral Faculty Sponsor

Publications

PUBLICATIONS

- **AJNR Study-Specific Guidelines for AI in Medical Imaging: Bridging Gaps in Reference Standard and Clinical Evaluation.** *AJNR. American journal of neuroradiology*
  Mei, J., van Voorst, H., Payabvash, S., Rauschecker, A. M., Pham, N., Pérez-Carrillo, G. J., Zaharchuk, G., Wintermark, M., Forghani, R.
  2026
- **Microcirculatory Collaterals Modulate Ischemic Core Heterogeneity on Diffusion-Weighted Imaging.** *AJNR. American journal of neuroradiology*
  Zamarud, A., Mlynash, M., Yuen, N., van Voorst, H., Ter Schiphorst, A., Seners, P., Wouters, A., Schwartz, M., Albers, G. W., Campbell, B., Dehkharghani, S., Lansberg, M. G., Heit, et al

2026

- **Deep learning-based non-contrast CT imaging markers enhance post-transfer DWI core volume prediction.** *AJNR. American journal of neuroradiology*
  van Voorst, H., Konduri, P., Ter Schiphorst, A., Vandewalle, L., Liu, Y., Jiang, B., Heylen, E., Mlynash, M., Christensen, S., Dehkharghani, S., Albers, G. W., Zaharchuk, G., Lansberg, et al
  2026
- **Deep generative models for vessel segmentation in CT angiography of the brain.** *Computers in biology and medicine*
  van Voorst, H., Su, J., Konduri, P. R., Majoie, C. B., Roos, Y. B., Emmer, B. J., Marquering, H. A., de Vos, B. D., Caan, M. W., Isgum, I., MR CLEAN Registry collaborators
  2026; 202: 111432
- **Both Infarcted and Noninfarcted Brain Regions Contribute to Deep Learning-Based MRI Prediction of Acute Stroke Outcome.** *AJNR. American journal of neuroradiology*
  Liu, Y., Jiang, B., van Voorst, H., Yu, Y., Li, S., Feng, H., Zhang, Z., Luo, S., Liebeskind, D. S., Moseley, M. E., Albers, G., Wintermark, M., Lansberg, et al
  2025
- **White matter lesion effect modification of aspirin and unfractionated heparin during endovascular stroke treatment.** *Insights into imaging*
  van Poppel, L. M., de Vries, L., Mojtahedi, M., van Voorst, H., Konduri, P. R., van de Graaf, R. A., van der Steen, W., Martou, L., Bentley, P., Marquering, H. A., Emmer, B. J., Majoie, C. B.
  2025; 16 (1): 224
- **Deep Learning Applications in Imaging of Acute Ischemic Stroke: A Systematic Review and Narrative Summary.** *Radiology*
  Jiang, B., Pham, N., van Staalduinen, E. K., Liu, Y., Nazari-Farsani, S., Sanaat, A., van Voorst, H., Fettahoglu, A., Kim, D., Ouyang, J., Kumar, A., Srivatsan, A., Hussein, et al
  2025; 315 (1): e240775
- **Endovascular Thrombectomy Alone for Large Vessel Occlusion: A Cost-Effectiveness Evaluation Based on Meta-Analyses.** *Stroke*
  Nguyen, C. P., Lahr, M. M., van der Zee, D., Rinkel, L. A., van Voorst, H., Pinckaers, F. M., Cavalcante, F., LeCouffe, N. E., Kappelhof, M., Treurniet, K. M., Coutinho, J. M., Majoie, C. B., Roos, et al
  2024
- **Deep learning-based white matter lesion volume on CT is associated with outcome after acute ischemic stroke.** *European radiology*
  van Voorst, H., Pitkanen, J., van Poppel, L., de Vries, L., Mojtahedi, M., Martou, L., Emmer, B. J., Roos, Y. B., van Oostenbrugge, R., Postma, A. A., Marquering, H. A., Majoie, C. B., Curtze, et al
  2024
- **Costs and health effects of CT perfusion-based selection for endovascular thrombectomy within 6 hours of stroke onset: a model-based health economic evaluation.** *Journal of neurology, neurosurgery, and psychiatry*
  van Voorst, H., Hoving, J. W., Koopman, M. S., Daems, J. D., Peerlings, D., Buskens, E., Lingsma, H., Marquering, H. A., de Jong, H. W., Berkhemer, O. A., van Zwam, W. H., van Walderveen, M. A., van den Wijngaard, et al
  2023
- **Cost-effectiveness of CT perfusion for the detection of large vessel occlusion acute ischemic stroke followed by endovascular treatment: a model-based health economic evaluation study.** *European radiology*
  van Voorst, H., Hoving, J. W., Koopman, M. S., Daems, J. D., Peerlings, D., Buskens, E., Lingsma, H. F., Beenen, L. F., de Jong, H. W., Berkhemer, O. A., van Zwam, W. H., Roos, Y. B., van Walderveen, et al
  2023
- **Cost-effectiveness of Direct Transfer to Angiography Suite of Patients With Suspected Large Vessel Occlusion.** *Neurology*
  Nguyen, C. P., Lahr, M. M., van der Zee, D. J., van Voorst, H., Ribo, M., Roos, Y. B., van den Wijngaard, I., Buskens, E., Uyttenboogaart, M.
  2023; 101 (10): e1036-e1045
- **Standardizing the estimation of ischemic regions can harmonize CT perfusion stroke imaging** *EUROPEAN RADIOLOGY*
  Peerlings, D., Bennink, E. W., Dankbaar, J. K., Velthuis, B. J., Emmer, B. W., Hoving, J. W., Majoie, C. M., Marquering, H. A., van Voorst, H., de Jong, H. M., CLEOPATRA Cost Effectiveness CT, DUST Dutch Acute Stroke Study
  2023
- **Accuracy of Four Different CT Perfusion Thresholds for Ischemic Core Volume and Location Estimation Using IntelliSpace Portal** *JOURNAL OF CARDIOVASCULAR DEVELOPMENT AND DISEASE*

Koopman, M. S. S., Hoving, J. W. W., Tolhuisen, M. L. L., Jin, P., Thiele, F. O. O., Bremer van der Heiden, L., van Voorst, H., Berkhemer, O. A. A., Coutinho, J. M. M., Beenen, L. F. M., Marquering, H. A. A., Emmer, B. J. J., Majoie, et al

2023; 10 (6)

- **Cost-effectiveness of tenecteplase versus alteplase for acute ischemic stroke** *EUROPEAN STROKE JOURNAL*

  Nguyen, C., Lahr, M. M. H., van der Zee, D., van Voorst, H., Roos, Y. M., Uyttenboogaart, M., Buskens, E., CONTRAST Consortium

  2023: 638-646

- **Endovascular treatment versus no endovascular treatment after 6-24 h in patients with ischaemic stroke and collateral flow on CT angiography (MR CLEAN-LATE) in the Netherlands: a multicentre, open-label, blinded-endpoint, randomised, controlled, phase 3 trial** *LANCET*

  Olthuis, S. G. H., Pirson, F., Pinckaers, F. M. E., Hinsenveld, W. H., Nieboer, D., Ceulemans, A., Knapen, R. M., Robbe, M., Berkhemer, O. A., van Walderveen, M. A. A., Nijeholt, G., Uyttenboogaart, M., Schonewille, et al

  2023; 401 (10385): 1371-1380

- **Role of intravenous alteplase on late lesion growth and clinical outcome after stroke treatment** *JOURNAL OF CEREBRAL BLOOD FLOW AND METABOLISM*

  Konduri, P., Cavalcante, F., van Voorst, H., Rinkel, L., Kappelhof, M., van Kranendonk, K., Treurniet, K., Emmer, B., Coutinho, J., Wolff, L., Hofmeijer, J., Uyttenboogaart, M., van Zwam, et al

  2023: 271678X231167755

- **Prognostic Value of Thrombus Volume and Interaction With First-Line Endovascular Treatment Device Choice** *STROKE*

  van Voorst, H., Bruggeman, A. A. E., Andriessen, J. W., Hoving, J. R., Konduri, P., Yang, W., Kappelhof, M., Terreros, N., Roos, Y. H., van Zwam, W., van der Lugt, A., van der Hoorn, A., Boiten, et al

  2023; 54 (4): 1056-1065

- **Infarct Evolution in Patients with Anterior Circulation Large-Vessel Occlusion Randomized to IV Alteplase and Endovascular Treatment versus Endovascular Treatment Alone** *AMERICAN JOURNAL OF NEURORADIOLOGY*

  Hoving, J. W., van Voorst, H., Kappelhof, M., Tolhuisen, M., Treurniet, K. M., LeCouffe, N. E., Rinkel, L. A., Koopman, M. S., Cavalcante, F., Konduri, P. R., van den Wijngaard, I. R., Ghariq, E., Meijer, et al

  2023: 434-440

- **Association between computed tomography perfusion and the effect of intravenous alteplase prior to endovascular treatment in acute ischemic stroke** *NEURORADIOLOGY*

  Hoving, J. W., van Voorst, H., Peerlings, D., Daems, J. D., Koopman, M. S., Wouters, A., Kappelhof, M., LeCouffe, N. E., Treurniet, K. M., Bruggeman, A. A. E., Rinkel, L. A., van den Wijngaard, I. R., Coutinho, et al

  2023: 1053-1061

- **Agreement between estimated computed tomography perfusion ischemic core and follow-up infarct on diffusion-weighted imaging** *INSIGHTS INTO IMAGING*

  Yang, W., Hoving, J. W., Koopman, M. S., Tolhuisen, M. L., van Voorst, H., Berkheme, O. A., Coutinho, J. M., Beenen, L. F. M., Emmer, B. J.

  2022; 13 (1): 191

- **Type of intracranial hemorrhage after endovascular stroke treatment: association with functional outcome** *JOURNAL OF NEUROINTERVENTIONAL SURGERY*

  van der Steen, W., van der Ende, N. A. M., Luijten, S. P. R., Rinkel, L. A., van Kranendonk, K. R., van Voorst, H., Roosendaal, S. D., Beenen, L. F. M., Coutinho, J. M., Emmer, B. J., van Oostenbrugge, R. J., Majoie, C. M., Lingsma, et al

  2022

- **Safety and efficacy of periprocedural antithrombotics in patients with successful reperfusion after endovascular stroke treatment** *JOURNAL OF STROKE & CEREBROVASCULAR DISEASES*

  van der Steen, W., van der Sluijs, P., van de Graaf, R. A., Su, R., Wolff, L., van Voorst, H., den Hertog, H. M., van Doormaal, P., van Es, A. M., Staals, J., van Zwam, W., Lingsma, H. F., van den Berg, et al

  2022; 31 (10): 106726

- **Outcome Prediction Based on Automatically Extracted Infarct Core Image Features in Patients with Acute Ischemic Stroke** *DIAGNOSTICS*

  Tolhuisen, M. L., Hoving, J. W., Koopman, M. S., Kappelhof, M., van Voorst, H., Bruggeman, A. E., Demchuck, A. M., Dippel, D. W. J., Emmer, B. J., Bracard, S., Guillemin, F., van Oostenbrugge, R. J., Mitchell, et al

  2022; 12 (8)

- **Unsupervised Deep Learning for Stroke Lesion Segmentation on Follow-up CT Based on Generative Adversarial Networks.** *AJNR. American journal of neuroradiology*

van Voorst, H., Konduri, P. R., van Poppel, L. M., van der Steen, W., van der Sluijs, P. M., Slot, E. M., Emmer, B. J., van Zwam, W. H., Roos, Y. B., Majoie, C. B., Zaharchuk, G., Caan, M. W., Marquering, et al

2022

- **Thrombus radiomics in patients with anterior circulation acute ischemic stroke undergoing endovascular treatment** *JOURNAL OF NEUROINTERVENTIONAL SURGERY*

  van Voorst, H., Bruggeman, A. A. E., Yang, W., Andriessen, J., Welberg, E., Dutra, B. G., Konduri, P. R., Terreros, N., Hoving, J. W., Tolhuisen, M. L., Kappelhof, M., Brouwer, J., Boodt, et al

  2022: e79-e85

- **Cost-effectiveness of CT perfusion for patients with acute ischemic stroke (CLEOPATRA)-Study protocol for a healthcare evaluation study** *EUROPEAN STROKE JOURNAL*

  Koopman, M. S., Hoving, J. W., van Voorst, H., Daems, J. D., Peerlings, D., Buskens, E., Lingsma, H. F., Marquering, H. A., de Jong, H. M., Berkhemer, O. A., van Zwam, W. H., van Walderveen, M. A. A., van den Wijngaard, et al

  2022; 7 (2): 188-197

- **Bifurcation occlusions and endovascular treatment outcome in acute ischemic stroke** *JOURNAL OF NEUROINTERVENTIONAL SURGERY*

  Terreros, N., Bruggeman, A. A. E., van Voorst, H., Konduri, P. R., Jansen, I. G. H., Kappelhof, M., Tolhuisen, M. L., Boodt, N., Dippel, D. W. J., van der Lugt, A., van Zwam, W. H., van Oostenbrugge, R. J., van der Worp, et al

  2023; 15 (4): 355-362

- **Safety and efficacy of aspirin, unfractionated heparin, both, or neither during endovascular stroke treatment (MR CLEAN-MED): an open-label, multicentre, randomised controlled trial** *LANCET*

  van der Steen, W., de Graaf, R., Chalos, V., Lingsma, H. F., van Doormaal, P., Coutinho, J. M., Emmer, B. J., de Ridder, I., van Zwam, W., van der Worp, H., van der Schaaf, I., Gons, R. A. R., Yo, et al

  2022; 399 (10329): 1059-1069

- **Fully Automated Thrombus Segmentation on CT Images of Patients with Acute Ischemic Stroke** *DIAGNOSTICS*

  Mojtahedi, M., Kappelhof, M., Ponomareva, E., Tolhuisen, M., Jansen, I., Bruggeman, A. A. E., Dutra, B. G., Yo, L., LeCouffe, N., Hoving, J. W., van Voorst, H., Brouwer, J., Terreros, et al

  2022; 12 (3)

- **Accuracy of CT perfusion ischemic core volume and location estimation: A comparison between four ischemic core estimation approaches using syngo.via** *PLOS ONE*

  Hoving, J., Koopman, M., Tolhuisen, M. A., van Voorst, H. M., Brehm, M., Berkhemer, O. A., Coutinho, J. J., Beenen, L. F. M., Marquering, H., Emmer, B., Majoie, C. M.

  2022; 17 (8): e0272276

- **Quantified health and cost effects of faster endovascular treatment for large vessel ischemic stroke patients in the Netherlands** *JOURNAL OF NEUROINTERVENTIONAL SURGERY*

  van Voorst, H., Kunz, W. G., van den Berg, L. A., Kappelhof, M., Pinckaers, F. M. E., Goyal, M., Hunink, M. G. M., Emmer, B. J., Mulder, M. L., Dippel, D. W. J., Coutinho, J. M., Marquering, H. A., Boogaarts, et al

  2021; 13 (12): 1099-+

- **A Randomized Trial of Intravenous Alteplase before Endovascular Treatment for Stroke** *NEW ENGLAND JOURNAL OF MEDICINE*

  LeCouffe, N. E., Kappelhof, M., Treurniet, K. M., Rinkel, L. A., Bruggeman, A. E., Berkhemer, O. A., Wolff, L., van Voorst, H., Tolhuisen, M. L., Dippel, D. J., van der Lugt, A., van Es, A. M., Boiten, et al

  2021; 385 (20): 1833-1844

- **Posttreatment Ischemic Lesion Evolution Is Associated With Reduced Favorable Functional Outcome in Patients With Stroke** *STROKE*

  Konduri, P., van Voorst, H., Bucker, A., van Kranendonk, K., Boers, A., Treurniet, K., Berkhemer, O., Yoo, A. J., van Zwam, W., van Oostenbrugge, R., van der Lugt, A., Dippel, D., Roos, et al

  2021; 52 (11): 3523-3531

- **Cost and health effects of case management compared with outpatient clinic follow-up in a Dutch heart failure cohort** *ESC HEART FAILURE*

  van Voorst, H., Arnold, A.

  2020; 7 (3): 1136-1144