

MagNav related publications

Aaron Nielsen

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- Blakely, B., Bonifaz, J., & Nielsen, A. (2025). Tolles-lawson coefficient dependence on an F-16. *Navigation, to Be Submitted*.
- Blakely, B., & Nielsen, A. (2025). Analysis of magnetic anomaly maps and navigation performance using flight test data. *2025 IEEE/ION Position, Location and Navigation Symposium (PLANS), Salt Lake City, UT*, 802–808.
- Nielsen, A., & Saltus, R. (2025). Review of magnetic anomaly navigation. *Navigation, to Be Submitted*.
- Blakely, B., Nielsen, A., Brinkley, D., & Cameron-Gonzalez, A. (2025, June). Magnetic anomaly map error analysis. *Joint Navigation Conference 2025*.
- Blakely, B., Sharma, R., Nielsen, A., & Taylor, C. (2025, June). MagNet: Magnetic networks for navigation. *Joint Navigation Conference 2025*.
- Duff, P., & Nielsen, A. (2025, June). Reference magnetic maps in marine areas from legacy data: Quantitative comparison of frequency dependent features, errors, and uncertainties in gridded magnetic data. *Joint Navigation Conference 2025*.
- Kurdian, A., Brink, K., McNally, B., Smearcheck, M., & Nielsen, A. (2025, June). Magnetic and gravity-based experimental navigation test and assessment (MAGENTA). *Joint Navigation Conference 2025*.
- Whitney, S., & Nielsen, A. (2025, June). Factor graph-based magnetic anomaly navigation: A robust bayesian inference approach. *Joint Navigation Conference 2025*.
- Duff, P., & Nielsen, A. (2024). Magnetic map-making for advanced applications: Quantitative comparison of frequency dependent features, errors, and uncertainties in gridded magnetic data. *AGU 2024*.
- Lathrop, F. W., Taylor, C. N., & Nielsen, A. P. (2024). Magnetic sensor compensation using factor graph estimation. *IEEE Sensors Journal*, 24(15), 23711–23722. <https://doi.org/10.1109/JSEN.2024.3416618>
- Lathrop, F., Nielsen, A., & Taylor, C. (2024). Magnetic sensor compensation utilizing factor graph estimation. *ION Joint Navigation Conference 2024*. <https://www.ion.org/jnc/abstracts.cfm?paperID=13344>
- Moradi, M., Zhai, Z.-M., Nielsen, A., & Lai, Y.-C. (2024). Random forests for detecting weak signals and extracting physical information: A case study of magnetic navigation. *APL Machine Learning*, 2(1). <https://doi.org/10.1063/5.0189564>

- Blakely, B., Bonifaz, J., & Nielsen, A. (2024, June). Improving tolles-lawson calibration with F-16 data. *ION Joint Navigation Conference 2024*. <https://www.ion.org/jnc/abstracts.cfm?paperID=13247>
- Rutkowski, A., Kerr, D., & Nielsen, A. (2024, June). On the accuracy of upward continuation and interpolation of magnetic anomaly maps. *ION Joint Navigation Conference 2024*. <https://www.ion.org/jnc/abstracts.cfm?paperID=13329>
- Srinivasan, A., & Nielsen, A. (2024, June). Temporal anomaly corrections for magnetic anomaly navigation. *ION Joint Navigation Conference 2024*. <https://www.ion.org/jnc/abstracts.cfm?paperID=13252>
- Whitney, S., Nielsen, A., & Grass, F. van. (2024, June). Comparative study of transect batch processing using variable map fidelity for magnetic anomaly navigation. *ION Joint Navigation Conference 2024*. <https://www.ion.org/jnc/abstracts.cfm?paperID=13338>
- Blakely, B., Bonifaz, J., & Nielsen, A. (2024, September). Magnetic calibration for navigation interpretation and applicability. *ION GNSS+ 2024*. <https://www.ion.org/gnss/abstracts.cfm?paperID=13837>
- Whitney, S., Nielsen, A., & Grass, F. van. (2024, September). Magnetic anomaly navigation using a multi-vehicle batch processing algorithm of variable map fidelity. *ION GNSS+ 2024*. <https://www.ion.org/gnss/abstracts.cfm?paperID=13646>
- Duff, P., & Nielsen, A. (2023). Comparative uncertainty estimation for global magnetic grids: Machine learning and statistical approaches. *Proceedings of American Geophysical Union 2023*.
- Duff, P., & Nielsen, A. (2023). *Estimating frequency dependent errors and uncertainties in gridded magnetic data, GP33D-0597, AGU23 11-15 dec.*
- Srinivasan, A., Bergeron, L., & Nielsen, A. (2023). *Extended geomagnetic ground reference station model and noise characterization, GP33D-0600, AGU23 11-15 dec.* Presented at AGU23 11-15 Dec.
- Nielsen, A. (2023). *2023 PLANS MagNav tutorial*. Tutorial presentation at IEEE/ION PLANS 2023. <https://afit-eeng-magnav.github.io/2023-PLANS-MagNav-Tutorial/>
- Nielsen, A., & Saltus, R. (2023). *MagNav workshop*. Workshop presentations at IEEE/ION PLANS 2023. <https://afit-eeng-magnav.github.io/2023-PLANS-MagNav-Workshop/>
- Bergeron, L., & Nielsen, A. (2023, April). Magnetic anomaly mapping for navigation. *2023 IEEE/ION Position, Location and Navigation Symposium (PLANS)*. <https://doi.org/10.1109/plans53410.2023.10140125>
- Nielsen, A. (2023). *Machine learning for magnetic anomaly navigation*. Presented at Wright-Brothers Insitute AI/ML Collider Event. <https://afit-eeng-magnav.github.io/2023-05-17-wbi-collider/>
- Bergeron, L., & Nielsen, A. (2023, June). Magnetic anomaly mapping for navigation. *2023 Joint Navigation Conference*.
- Blakely, B., Bonifaz, J., & Nielsen, A. (2023, September). Tolles-lawson coefficient dependence using F-16 data set. *Proceedings of GNSS+ 2023*. <https://www.ion.org/gnss/abstracts.cfm?paperID=12765>
- Canciani, A., & Nielsen, A. (2023). *Absolute positioning using magnetic anomaly fields: An introduction to the technique and a summary of extensive ongoing development of aircraft,*

- surface ship, and sub-surface ship navigation systems utilizing earth magnetic anomaly fields to navigate. (Invited) GP32A-03 (GP32A-03). AGU 2023.*
- Gnadt, A. R., Wollaber, A. B., & Nielsen, A. P. (2022). *Derivation and extensions of the Tolles-Lawson model for aeromagnetic compensation.* arXiv. <https://doi.org/10.48550/ARXIV.2212.09899>
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- Nielsen, A. (2022). *Machine learning for magnetic navigation.* Presented at September Meeting of Gem City Tech Machine Learning Group. https://gemcityml.com/magnav_contest/
- Lathrop, F., Taylor, C., & Nielsen, A. (2022, October). Accurate magnetic field compensation in large platform fields. *ION GNSS+, the International Technical Meeting of the Satellite Division of the Institute of Navigation.* <https://doi.org/https://doi.org/10.33012/2022.18538>
- Nielsen, A., Gray, J., & Bonifaz, J. (2022, October). Accounting for magnetic anomaly map artifacts in magnetic navigators. *ION GNSS+ 2022.* <https://doi.org/10.33012/2022.18323>
- Nielsen, A., Gray, J., Curro, J., Boettcher, E. J., & Leishman, R. (2021). Operationalizing MagNav. *ION JNC 2021.*
- Samanant, P., Stephens, T., Compton, R., Morton, B., Canciani, A., & Nielsen, A. (2021). Honeywell magnetic anomaly aided navigation. *ION JNC 2021.*
- Gnadt, A. R., Belarge, J., Canciani, A., Carl, G., Conger, L., Curro, J., Edelman, A., Morales, P., Nielsen, A. P., O’Keeffe, M. F., Rackauckas, C. V., Taylor, J., & Wollaber, A. B. (2020). *Signal enhancement for magnetic navigation challenge problem.* arXiv. <https://doi.org/10.48550/ARXIV.2007.12158>