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## Abstract

In this paper it have been shown that how ARTMAP (ART1) neural networks can be used to compute automatically a balanced sectoring of airspace to increase air traffic control capacity in high density airspace area. Crossing points between two airports may generate conflicts between two aircrafts when their trajectories converge on it at the same time and induce a risk of collision.

## Refer

## ences

- Min Xue. 2008. Airspace Sector Redesign Based on Voronoi Diagrams. University of California at Santa Cruz, Moffett Field, CA 94035.

- Delahaye, D.; Schoenauer, M.; Alliot, J.-M. 1998. Airspace sectoring by evolutionary computation. Evolutionary Computation Proceedings. IEEE World Congress on Computational Intelligence. The 1998 IEEE International Conference on Volume , Issue , 4-9 May 1998 Page(s):218 – 223, Digital Object Identifier 10.1109/ICEC.1998.699504.

- Daniel Delahaye, .Jean-Marc Alliot, Marc Schoenauer, and Jean-Loup Farges. Genetic algorithms for partitioning airspace. 1994. In Proceedings of the 10th IEEE Conference on Artificial Intelligence Application.

Brankica Pesic, Daniel Delahaye. Daily Operational airspace sector grouping. April 27,

1999.

- Inseok Hwang, Claire Tomlin. Protocol-based Conflict Resolution for Finite Information Horizon. American Control Conference. 2002. Proceedings of the 2002 Volume 1, Issue, 2002 Page(s): 748 - 753 vol.1.

- J. Hu, J. Lygeros, M. Prandini, and S. Sastry. Aircraft conflict prediction and resolution using Brownian motion. 1999. IEEE CDC, Pheonix, AZ.

- O babic, T Kristic. Airspace daily operational Sectorization by fuzzy logic. 2000. Published by Elsevier.

http://delhiairport.com/php/showFlightStatus.php

- Riley, V. Chatterji, G. Johnson, W. Mogford, R. Kopardekar, P. Sieira, E. Landing, M. Lawton, G. Pilot Perceptions of Airspace Complexity. Part 2. 2004. Digital Avionics Systems Conference. DASC 04, IEEE.

- Carpenter, G.A. & Grossberg, S. 2003. Adaptive Resonance Theory, In M.A. Arbib (Ed.), the Handbook of Brain Theory and Neural Networks, Second Edition (pp. 87-90).

- Grossberg, S. 1987. Competitive learning: From interactive activation to adaptive resonance. Cognitive Science (Publication), 11, 23-63.

- D. Klingman and J. M. Mulvey editors. Network models and associated applications. 1981. North Holland. ISBN: 0-444-86203-X.

- Gilbert Saporta. 1990. Probabilistic analysis of statistic techniques.

- P.L. Tuan, H.S. Procter, and G.J. Couluris. 1976. Advanced productivity analysis methods for air traffic control operations. FAA report RD-76-164. Stand ford Research Institute. Mento Park CA 94025. December 1976.

Chung-Kuan Cheng. 1992. The optimal partitioning of networks. Networks. 22:297-315.

- Lester Ingber and Bruce Rosen. 1992. Genetic Algorithm and fast simulated re-annealing: a comparison. Mathematical and Computer Modeling. 16(1):87-100.

- Daniel Delahaye, Jean-Marc Alliot, Marc Schenauer, and Jean-Loup Farges. 1994. Genetic algorithms for partitioning air space. In proceedings of the 10th Conference on Artificial Intelligence and Application. IEEE, 1-4 Mar 1994 Page(s):291 – 297.

- Samir W. Mahfoud and David E. Goldberg. 1992. Parallel recombinative simulated annealing: a genetic algorithm. Report 92002. University of Illinois at Urbana-Champaign, 104 South Mathew avenue Urbana, IL 61801.

- K. Kumar, R. Singh, Z. Khan. 2008. Air Traffic Enroute Conflict Detection Using Adaptive Resonance Theory MAP NEURAL NETWORKS (ART1). Published in Ubiquitous Computing and Communication International Journal (UBICC), Korea, Volume 3, No 3, July 31. ISSN 1992-8424.

- K. Kumar, K. Kumar, R. Singh, Z. Khan, A. Indian. Air Traffic Runway Allocation Problem ARTMAP (ART1). 2008. Published in Ubiquitous Computing and Communication international Journal (UBICC), Korea Volume 3, No 3, July 31. ISSN 1992-8424.

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