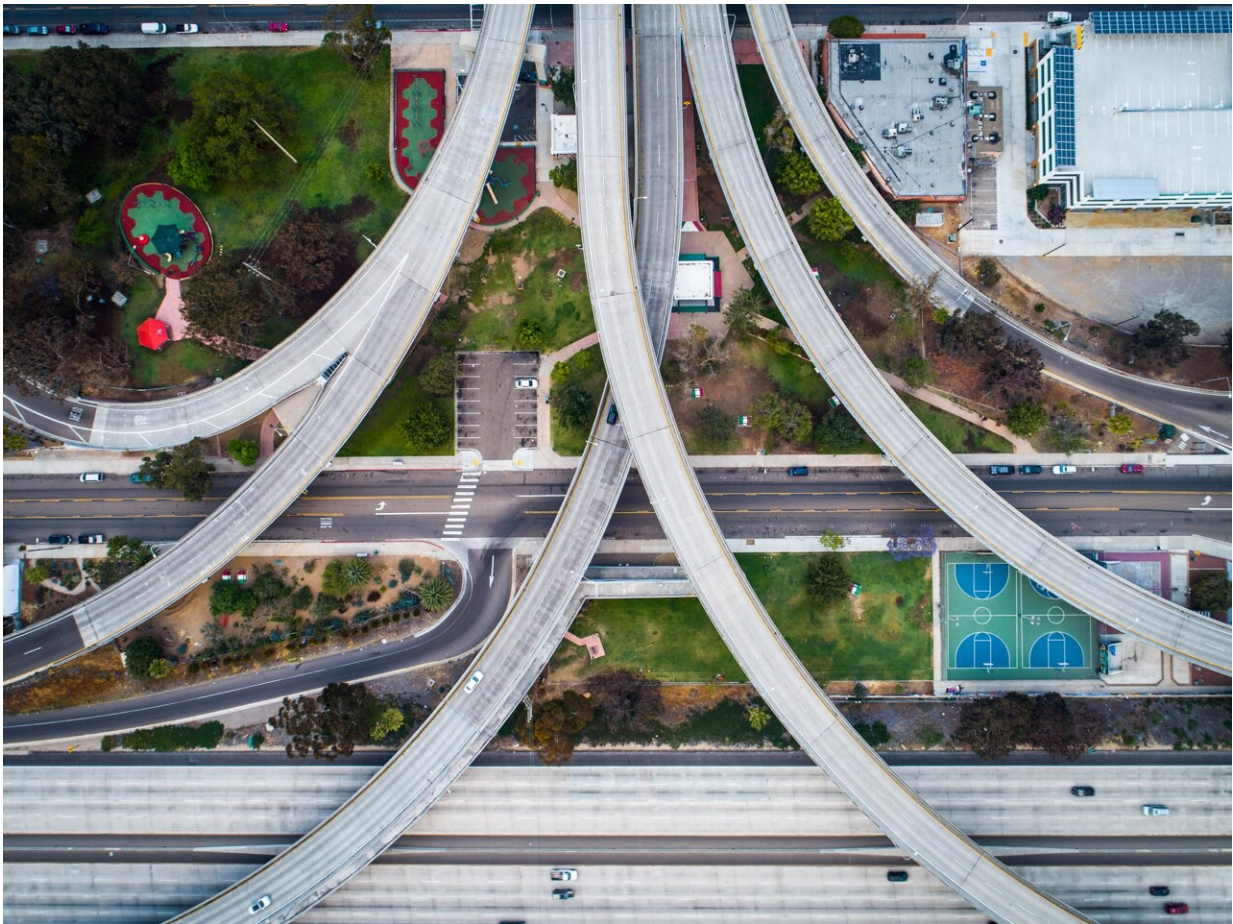


# An artificial bee colony algorithm for predicting road traffic accidents

June 16 2023, by David Bradley

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Researchers have developed a novel artificial intelligence (AI) model

that combines an algorithm based on the scouting and foraging behavior of bee colonies with a fuzzy wavelet neural network to accurately predict road traffic accidents

The artificial bee colony algorithm is a swarm intelligence algorithm that has been used to solve complex optimization problems in the past. Now, writing in the *International Journal of Computing Science and Mathematics*, Zhicheng Li of the Department of Urban Rail Transit and Information Engineering at Anhui Communications Vocational and Technical College in Hefei, China, has introduced self-adaptive mutation operations to overcome the algorithm's known limitations. The use of a fuzzy wavelet neural network reduces the time needed to solve a problem and improves its search skills for finding a solution.

The artificial bee colony algorithm consists of [worker bees](#), onlooker bees, and scout bees. Worker bees explore solutions based on specific rules, while onlookers select promising solutions using information shared by the workers. The scouts introduce new random solutions to boost the diversity of possible solutions in processing the data.

Through an iterative process, the algorithm converges toward an optimal or near-optimal solution to the problem, in this case the nature of road traffic accidents. The fuzzy wavelet neural network uses [fuzzy logic](#) and various statistical tools within a conventional neural network to handle uncertainty and imprecision within the data.

Li has carried out [computer simulations](#) with the system to see how well it might predict fatalities in road traffic accidents based on the various factors associated with a particular incident.

"Computer simulations show that this prediction method fully exploits the nonlinear approximation ability of the wavelet [neural network](#) model, effectively improves convergence speed and training efficiency, and

reduces [computational complexity](#)," writes Li.

The work has the potential to improve our ability to anticipate and prevent lethal [road traffic accidents](#) by allowing limited resources to be more usefully assigned to proactive measures and road safety strategies. There are, in addition, implications for the arrival of driverless vehicles on our roads.

**More information:** Zhicheng Li, Traffic accident prediction based on an artificial bee colony algorithm and a self-adaptive fuzzy wavelet neural network, *International Journal of Computing Science and Mathematics* (2023). [DOI: 10.1504/IJCSM.2023.131464](https://doi.org/10.1504/IJCSM.2023.131464)

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