

Journal of Emerging Investigators

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FOR IMMEDIATE RELEASE

New Hampshire high school student duo develop efficient trajectory to travel between planets and publish work in academic journal

Anusha Murali from Bishop Brady High School in Concord, NH, and Evan Chandran from Phillips Exeter Academy in Exeter, NH, recently published a scientific manuscript titled, "Optimizing Interplanetary Travel Using a Genetic Algorithm" in the *Journal of Emerging Investigators*.

Murali and Chandran's research, published on October 28, 2018, delivers a mathematical analysis of space travel and proposes a new way to plan interplanetary expeditions. The team used a genetic algorithm, a method for solving optimization problems, and calculated the shortest paths between planets. Because planets have circular orbits with different angular velocities, it is significantly harder to determine an efficient path between them. Furthermore, the genetic algorithm works so well because it is bimodal and can rapidly converge to a near optimal solution. The team compared the results of their genetic algorithm with a unimodal enumeration-based brute-force algorithm, which is more standard in solving optimization problems.

Murali and Chandran are continuing their research to investigate other facets of space travel. For example, their genetic algorithm does not factor in gravitational influence on the star and the planets on the spaceship, or the timing and direction of fuel firing to efficiently navigate the spaceship. The team believes that there may be an optimal route that may not be the shortest, but is likely to cost the least amount of fuel. While Murali and Chandran recognize that this is a harder problem to solve, they believe this work is important in continuing to optimize space travel.

The *Journal of Emerging Investigators (JEI)* is a non-profit scientific journal operated by graduate students at Harvard University. JEI is dedicated to mentoring young scientists in middle and high school and publishing their research through the online journal. Articles submitted to JEI pass through a rigorous editorial and scientific review process by several PhD-level scientists before they are accepted and published.

Link to Murali and Chandran's full article: <https://emerginginvestigators.org/articles/optimizing-interplanetary-travel-using-a-genetic-algorithm>

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