













It is observed that the obtained solutions can be more expensive in distance or time of the solutions obtained directly from geospatial maps, nevertheless the precise solutions for the real instances are guaranteed.

As future work, different variants of the TSP will be compared, as well as the extension of the application of the TSP to the vehicle routing problem (VRP) and its variants.

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**Leonardo G. Hernandez-Landa** holds a BSc. in Industrial Engineering from ITSPe in Veracruz, México and earned his PhD in Engineering from the graduate program in System Engineering at Department of Mechanical and Electrical Engineering, Universidad Autónoma de Nuevo León (UANL). Leonardo is currently a Professor of operations management at Department of Industrial Engineering Administration, UANL in San Nicolás de los Garza, México, where he joined in 2016. Dr. Hernandez' research has primarily focused on methods for solving difficult discrete optimization problems arising in logistic, routing and transportation systems. Previously, he has conducted funded research on vehicle routing problems with accessibility and route design. Dr. Hernandez is a SNI Fellow second highest country-wide distinction granted by the Mexican System of Research Scientists, where he has been a member since 2017. Dr Hernandez live very happily with his wife and family in Apodaca Nuevo León, México.

**Rosa Elena Mata-Martínez** holds a BSc. in Chemistry Pharmacist Biologist from Universidad Autónoma de Nuevo León (UANL) in Nuevo León, México and eamed her Master of Superior Education from the graduate program in Facultad de Filosofía y Letras. Rosa Elena is actually a Professor of Chemistry, Materials Technology and Manufacturing Process at Department of Industrial Engineering and Administration, UANL in San Nicolás de los Garza, México, where she joined in 1992. Ms. Mata Mtz. Research has focused on Education Problems, Company Situations on Engineering Area and Pharmacist Aspects. Ms. Mata Mtz. has a PRODEP (Programa para el Desarrollo Profesional Docente, para el tipo Superior) distinction where she has been a member since 2009. Ms. Mata Mtz has one daughter and lives San Nicolás de los Garza, N.L.