OPERATIONS RESEARCH & COMPUTER SCIENCE INTERNSHIP

Keywords: vehicle routing, logistics, dynamic programming, stochastic optimization

PROJECT MOTIVATION & GOALS

Motivated by environmental concerns and regulations, automotive manufacturers have invested heavily in the development of electric, zero-emission vehicles (ZEVs). The popularity of ZEVs is growing in commercial sectors. For example, in France, mail is delivered via electric trucks. Similarly, European delivery companies are transitioning their fleets from vehicles powered by fossil fuels to ZEVs. Because most electric vehicles have limited driving ranges, they must refuel more often than non-ZEVs. In contrast to the quick refueling process available to most non-ZEVs, recharging a battery may require several hours. Consequently, charging station capacity is typically much smaller than the capacity of non-ZEV fuel stations and queue times are higher. Because charging station availability is often hard to predict, it can be difficult to efficiently plan mid-route recharging of an electric vehicle. Although the vehicle routing literature addresses a wide array of routing problems, little or no work focuses on electric vehicle routing strategies that hedge against uncertainty in charging station availability -- the project aims to fill this gap.

The goal of the project is to identify high-quality logistics schemes to route electric vehicles when charging station availability is uncertain. Under the guidance of university faculty, the intern will contribute his or her ideas to ongoing research, will assist with the implementation of computer code to examine various solution approaches, and will participate in the write-up and submission of results to an academic journal in the field of transportation and logistics.

CONTEXT

The project is part of *electric vehicle routing optimization (e-VRO),* a 4-year project funded by ANR (http://www.agence-nationale-recherche.fr). The intern will be based at Polytech Tours (http://polytech.univ-tours.fr) and be part of team OC (ERL CNRS 6305) at the Computer Science Research Lab (http://li.univ-tours.fr). The internship will be supervised by: Dr. Justin C. Goodson from Saint Louis University (http://www.slu.edu/~goodson) and Dr. Jorge E. Mendoza from Polytech Tours (http://www.jorge-mendoza.com). Salary is around 500€/month.

The duration of the internship is six months. Although the start date is flexible, beginning during February 2016 is preferable. A successful internship may lead to scholarship funds for future doctoral study.

DESIRED QUALIFICATIONS

The ideal applicant possesses strong computer programming skills (preferably in Java); is familiar with operations research models and methods including dynamic programming, math programming, and stochastic optimization techniques; and is able to communicate comfortably in English. Such applicants may be master's students in operations research, management science, industrial engineering, or applied mathematics programs.

CONTACT

Interested applicants should contact Dr. Jorge E. Mendoza (jorge.mendoza@univ-tours.fr) and Dr. Justin C. Goodson (goodson@slu.edu) attaching to the email: an up-to-date CV, a letter of motivation, transcripts for the last two academic years, and the name and contact information of 2 professional references. The deadline for applications is November 30, 2015.