Alumni Mentored Internships

IE 399 Summer Practice Project Proposal Form

Alumni Information

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Position: Lecturer, Department of Economics

Project Title: Understanding the Daily Epidemiological Forecasts when Incubation Period is Long

Planned Start Date: 29 June 2020   <<<22 work days>>>   **Planned End Date:** 29 July 2020

Project Overview: Legal framework: The project is intended to be a preliminary stage of an upcoming academic project which will be concerted in a transdisciplinary manner in Fall 2020. The members of the IE 399 project team will be natural members of the project consortium with full protection of their intellectual property rights up to any academic and/or commercial outcomes.

Technical framework: Built upon the standard SEIR (Susceptible, Exposed, Infected, Recovered) scheme of epidemiology, first a baseline simulation framework is to be developed using the traditional as well as newer tools of industrial engineering / system analysis, focusing mainly on accuracy and expandability. In the baseline model, essential measurement nodes (initial identification of sickness, clinical/medical testing and closure) are to be fully implemented. Second, an array of parameters is to be incorporated to address the shortcomings of the baseline model. In that, social isolation measures (ranging from local measures to total curfews) and agents' attitudes (full compliance versus cheating behavior) will be added. Third, the developed simulation models will be re-elaborated to understand differing degrees of social connectedness (population density, nature of work environments of different industries, school sizes and types, and the like) on numerical outcomes.

Computational framework: Where the already established software like ARENA is usable, a more flexible toolset including R or Matlab is welcome. At many critical turning points of the project, spreadsheet solutions via MS Excel might be a plus in addition to a good command of MATH 250, MATH 260 and IE 325.

Work flow and communication framework: The activities/tasks of the project are of a creative rather than clerical nature. So, the project will be carried out via several intermittent meetings and close collaboration. A three-member team seems to be sufficient to allow for effective administration and a fair division of labor. The team members might enjoy the project more in the absence of other commitments at their side; that not being a selection criterion.

Additional information: The interested young colleagues may visit https://sites.google.com/view/erayyucel/bio for my credentials.