"The Value of Excess Supply in Spatial Matching Markets"
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Audience Q&A

Q Omer Saritac: Are waiting times significantly different for different regions?

A: Hi Omer! Yes, also by time of day.

Saritac: Then, is it possible that the difference in value of time can be partly explained by nonlinearity of value of time?

A: I am not sure what part of the "difference in the value of time" you are referring to :)
But when we add non-linear terms to the regression, we only faintly pick up a squared term.

A: Thanks for the question Omer. Both greedy and omniscient match immediately, so we could have introduced a non-linear cost of waiting time. Does that answer your question?

Saritac: Let me be more clear. For example, if it is true that the value is exponential with respect to time and the waiting times for the region in the north-east part of the city is high, then the linear assumption will lead to overestimated values of time.

A: I see… note that we allow the value of time to vary across individuals, location, and time of day so I am not sure this is an issue.

Saritac: Okay, thanks!

Q Richard Faltings: Question on the interpretation of waiting time valuation. If I am forward looking and I know a specific time I want to make a trip, wouldn't I check the app ahead of time to pay less? If so, it seems the interpretation as a net value of time would fit best in cases where the departure time is unknown ahead of time.

A: Hi Richard! This is interesting… I am not sure whether it changes the interpretation of the net value of time, but it would say that the prices the consumer observes are somewhat "optimized". Also, I am not sure that this mechanism you suggest is that relevant for this app.

Q Noémie Bucourt : Hi! to clarify, the prices we saw on the pictures in the first slide were the bids by the drivers or the price set by the platform?

A: Hi Noemie, they were the bids by the drivers.

Q Alireza Amanihamedani: Is there a capacity constraint for the number of matches to a driver?

A: For the talk assume each driver can take only one passenger.

Q Bobby Pakzad-Hurson: Many spatial models assume a strictly convex travel cost. Is there a particular reason you have cost = Euclidian distance?

A: Thanks for the question. In the talk we present the result for Euclidean cost, but it's generalizable to convex costs.

Q Nikhil Agarwal: In the model, is there a cost of keeping riders waiting?

A Yeganeh Alimohammadi: Yes, but the benchmark algorithms don't wait and just match immediately.

Agarwal: It seems from this result that the number of drivers that need to be added increases with n. So, if there is a cost of having more drivers around, could it not be the case that it does not make sense to add more drivers?

Alimohammadi: True, at least in the limit.

Agarwal: It seems from this result that the number of drivers that need to be added increases with n. So, if there is a cost of having more drivers around, could it not be the case that it does not make sense to add more drivers?

Alimohammadi: Thanks! It'd be useful to get a sense of what the lowest value of C_\epsilon depends on.

Alimohammadi: I want to add to what Mohammad answered. With simulations we have seen that greedy needs sublinear number of extra drivers to beat omniscient. (the epsilon is dropping with n). In our result Epsilon grows with epsilon^(-2).

Q Shankaranarayanan Gopalan: Does this consider the relative delay between the choice made by the potential passengers in this case?

A Yeganeh Alimohammadi: Do you mean if the rider decided to take the ride? We assume when greedy matches a driver to a rider we just have to pay for the distance cost. Sorry, it was supposed to have been relative delay.

Gopalan: Thank you for the clarification.

Gopalan: No, since the distance between two passengers are similar or in some cases smaller than the original, but as the prof showed on the slide the distance between the new passenger is lesser than the passenger originally allocated. So, would the passenger time choice or latency in making the choice decide the allocation of ride to a specific passenger?

Alimohammadi: If I understand your question correctly, we are not specifically modelling passenger latency, but I guess it won't matter in the qualitative results.

Q Yu Fu Wong: It seems that the huge value of excess supply drops off very quickly around the balanced market. Given that it's hard to balance the market exactly, e.g. surge demand, idiosyncratic driver schedules, how useful are "a few more seeds" in this case?

A Yeganeh Alimohammadi: You're right. The way we see this is that you want to manage supply and demand in a way that you're always in the "having slack" mode despite uncertainties.

Q Larry Wein: Really nice results, Mohammad et al! Would the results change qualitatively if you considered the unit square rather than the unit interval (i.e., 2-d rather than 1-d)?

A Yeganeh Alimohammadi: Thanks Larry. In a square, if we restrict the drivers to drivers to move on well-spaced grids then we guess similar qualitative results hold.

Q Alejandro Robinson Cortes: Have you tried, in simulations, starting with unbalanced markets in which there are less drivers? If the gains are very large (as sounds would be the case), this would mean that in these markets the WTP for more supply should be v large.

A: Yes, we can start simulations with less drivers, but then it will depend on the cost of not matching a rider.