

# impact

## The Driverless City

August, 2016

**Team:** Marshall Brown, Lili Du, Laura Forlano, Jack Guthman, Ron Henderson

**Progress for 2<sup>nd</sup> and 3<sup>rd</sup> Quarters:**

### Technical research:

- Lili Du completed the first phase study on platoon car-following mathematical modeling, including simulation as well as video making.
- Marshall Brown, Ron Henderson, and design research associates worked on developing urban design scenarios.

### Papers:

- Journal: Siyuan Gong, Jinglai Shen, Lili Du (2016). Distributed computation-based car-following control integrating optimal system performance for a platoon of autonomous vehicles. *Transportation Research Part B: Methodological*. Under revision.
- Conference: Siyuan Goig, Jinglai Shen, Lili Du. Constrained Optimization and Distributed Computation based Car Following Control of a Connected and Autonomous Vehicle Platoon. 96th Annual Meeting of the Transportation Research Board, Washington DC, January 8-12 2017. Under review.
- Conference Presentation: Distributed Computation-based Car-following Control Integrating Optimal System Performance for a Platoon of Autonomous Vehicles, INFORMS 2016, Nashville, Nov. 13-16, 2016.

### Secondary Research:

- Compiled a broad literature review of over 160 relevant articles and papers about the topic.
- Conducted a specific literature review on specific topics related to the primary research.
- Jack Guthman conducting review of current legal issues and precedents.

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## Outreach:

- Conducted outreach to several key projects in the Chicago area including the Array of Things and City Digital in order to explore potential partnerships.
- Conducted outreach to contacts at Ford and Nissan as background/informational interviews.
- Marshall Brown developed contact with Michigan Municipal League.

## Qualitative Interviews

- Completed IRB application and received approval to begin qualitative research.
- Conducted outreach to over ten experts in the Chicago area for one-hour qualitative interviews to inform research and scenarios.
- Conducted and transcribed three one-hour interviews.
- Reviewing and analyzing interviews to identify key quotes for the final report.

## Site Visit

- Conducted one site visit to the University of Michigan's MCity testbed in Ann Arbor.
- Transcribed notes from the site visit.
- Identified key themes from the site visit to inform the secondary research and framing of subsequent publications.

## Driverless City Card Deck

- Created multiple iterations of the card deck/game prototype from April 1<sup>st</sup> – August 1<sup>st</sup> in order to refine the key concepts and design.
- Ran a workshop with Chicago Humanities Festival Summer Doctoral Program in order to test the card deck/game prototype with external participants.

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- Administered a survey with Chicago Humanities Festival Summer Doctoral Program in order to evaluate the results of the workshop.
- Conducted three follow up interviews with participants from the Chicago Humanities Festival Summer Doctoral Program in order to learn about their experiences using the card deck in more detail.

## Speaking Events

- Laura Forlano has been invited to participate in a panel on the topic of “Speed” along with designers from IDEO as part of the Fall Chicago Humanities Festival.
- Driverless City, public lecture by Ron Henderson, Tongji University, Shanghai PRC, January 4, 2016.
- Driverless City, public lecture, Tsinghua University, Beijing PRC, January 7, 2016.
- Distributed Coordinated in-Vehicle Online Routing Using Mixed-Strategy Congestion Game, public lecture by Lili Du, University of Michigan, March, 17 2016.
- Stochastic Poisson Game for an Online Decentralized and Coordinated Parking Mechanism, public lecture by Lili Du, Tsinghua University, China, June 21, 2016.
- Distributed Coordinated in-Vehicle Online Routing Using Mixed-Strategy Congestion Game, public lecture by Lili Du, University of Science and Technology of China, June 27, 2016.
- Research in Connected and Autonomous Vehicle Systems, public lecture by Lili Du, Tsinghua University, China, July 13, 2016.
- Research on Connected and Autonomous Vehicle Systems: Information Propagation via V2V and Coordinated Driving, public lecture by Lili Du, Chang’an University, China, July 20, 2016.
- Allegheny Conference on Community Development panel, Marshall Brown, panelist, July 11, 2016.

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## College of Architecture Advanced Landscape Studio

- February 5, Nayar Prize Faculty Landscape Architecture Studio Workshop (Brown, Du, Forlano, Henderson, O'Shea and students).
- IIT Driverless City Studio, an ongoing investigation of transportation technology history and benchmarking of early twenty-first century transportation.
- February 10, presentation by Driverless City Studio visiting lecturer Peter Stempel, University of Rhode Island.
- April 8, presentation by Driverless City Studio visiting lecturer Trevor Lee, OLIN/University of Pennsylvania.
- April 25, IIT Driverless City Studio Final Review (Brown, Du, Forlano, Henderson, O'Shea, Lucius and students).

## Media

- Marshall Brown and Lili Du interviewed for WIRED article, April 6, 2016.
- Marshall Brown interviewed on air with KCBS radio San Francisco, April 9, 2016.

## Updates to 4<sup>th</sup> Quarter Plans:

- Design team continuing to develop urban design scenarios.
- Working with Thirst Graphic Design to produce book for final report.
- Continuing outreach to secure location and dates for exhibition.
- Completing design and fabrication for card deck.