

NETLOGO WORKHSOP

CS 704: Social Simulation Seminar, Session V

Jakob Gutmann, Kilian Theil, and Heiner Stuckenschmidt

Chair of Artificial Intelligence @UniMA

4 April 2022

SETUP

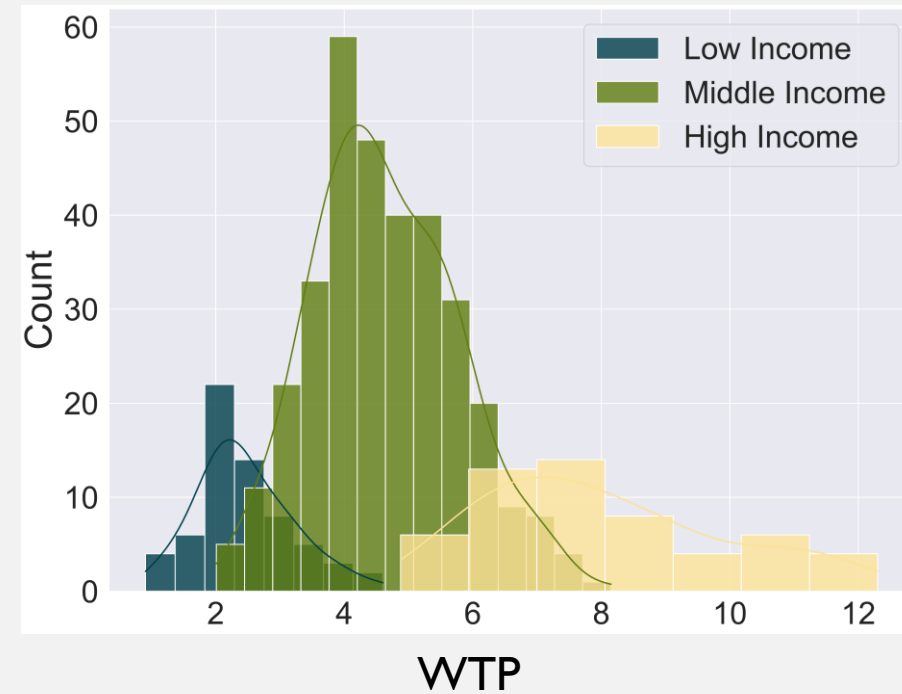
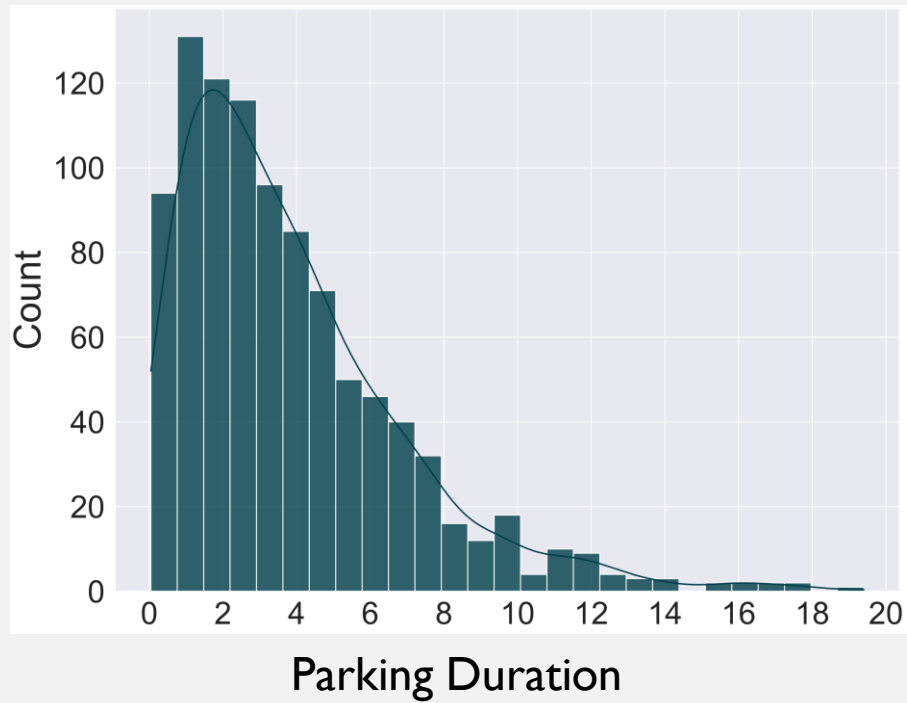
GENERAL SETUP FUNCTION

- Sets up model for simulation:
 - Calls all subordinate setup functions (cars, node network, patches (roads, intersections, parking spaces))
 - Initializes global variables
 - Sets tick counter up
- Handles optional functionality (documentation of all turtles individually, demo-mode)
- Some subordinate setup function are recalled during model execution (spawn new cars!)

SAMPLING FUNCTIONS

- A series of agents' attributes are drawn from reporter functions (*draw-park-duration*, *draw-income*, *find-income-grade*, *draw-wtp*, *compute-income-entropy* (currently not used))
- Introduce randomness into the model that must be (and hopefully is) handled
- Require limiting of setup processes

DISTRIBUTIONS



GO

GO FUNCTION

- is called once for every iteration (tick) of the model
- calls a series of functions defined by the Traffic Grid model (set-signals, set-car-speed, etc.), which handle traffic lights and car acceleration
- loops over all cars to handle navigation, parking, unparking & dying behaviors
- documents globals and required turtle variables

NAVIGATION

- *navigate*: curates list of closest parking opportunities to goal (assigned by *set-navgoal*), selects two streets per parking zone, saved in *nav-prklist* attribute
- *determine-path*: takes in start node and target lot, returns path to target lot (*nav-pathfollow*)
- *determine-finaldestination*: plots path to one of exits of model grid
- *compute-alternative-route*: look for alternative routes in cases of persistent congestion
- turns are accomplished via *face* in the *go* function

PARKING

- once car enters street with parking opportunity in *nav-prklist*, *park-car* is called
- *park-car*:
 - curbside: check for free spaces left and right, if free park
 - garage: call *park-in-garage* with *gateway*
- *unpark-car*:
 - curbside: once park-time is exceeded, move back onto street
 - garage: call *unpark-from-garage*

SUPPLEMENTARY FUNCTIONS (1/2)

- *update-baseline-fees*: adjust parking fees dynamically for curbside parking zones every 30 minutes
- *update-wtp*: update WTP by 5% or set up cars for dying
- *recreate-cars & keep-distro*: keep track of how many cars to respawn during every tick and keep distribution of income classes constant
- *control-lots*: randomly check one of the parking lots for parking offenders
- *compute-fine-prob*: function to compute expected fine for potential offenders

SUPPLEMENTARY FUNCTIONS (2/2)

- *change-fee* & *change-fee-free*: functions to change prices from outside the simulation
- *document-turtle*: save data about individual turtles in .csv when they die
- *compute-outcome*: compute current utility of turtles depending on access, egress, price paid, and expected fine (currently only used for one publication from outside the simulation)

WHERE TO GO FROM HERE

- organize yourself
- schedule (regular) meetings (with us)
- begin with the parking behavior based on the (non-complete) literature that we gave you (one more paper in the literature folder)
- potential extensions will come up when working on the model
- we care about individual contribution!