**Introduction: Limitations of Modern Game Theory**

My main point of contention with modern day Game Theory is how easy it is to abstract entire planes of data that cross multiple different geometries (temporal, spatial, circumstantial) into one stock variable. Using this as the basis to pursue scalable models implies an inherent flaw in the foundation where it is not optimized for flow. The simple fact of hinging it all on discontinuous data while using it as a representative for real world issues is a transgression of comprehensive strategy mapping. The fact it is constructed for insular calculations wherein agents are disparate and the dynamics that dictate them such as mean field as meant to imply steady states.

**Foundational Approach**

I approached this issue from a different angle and tried to build the real-world simulation out from first principles. I believe before you can represent attributes and values into a certain equation, especially those that are constantly changing, you must have the adequate plumbing infrastructure for it to emulate flow. This plumbing infrastructure I deployed was a kernel-based system to bridge two agents together by using the philosophy of trajectories and undercurrents.

**Concept of Trajectories and Undercurrents**

Trajectories are the perceptive tangible reality that you can interact with and map, this is reflected as edge data integrations where multiple different agents work together for an intended function. We can see this within a car; the dashboard shows the speed. What it does not display is the harmony of the engine and the gears that enable the car to move as well as the pressure feedback that needs to have disproportionate influence. This is the undercurrents within the car and the whole set of variables and influences underneath it. The entire world forms as a convergence of trajectories and undercurrents, the implicit intended state and the mechanics under it that enable that state.

**Structure of the Model**

To represent this temporal depth without falling into the static fallacy of game theory, you require a solution that technically enables dynamism and accounts for real world resonance and instability. Game Theory makes too far a sweeping assumption of intrinsic stability within the strategies, and it’s wired to transmute one fixed outcome where the payoff function implicitly tends to one well defined known state. This does not reflect the real world where there are elements of transformation not able to be perceived at present time and residue from the actual transformation.

**Kernel System as Connective Infrastructure**

Standard game theory is dominated by trajectories where the entire calculation is hinged on future stability and a switch transformation. Within the new model, undercurrents play the crucial role in discerning the true trajectory. These undercurrents are integrative of so many different variables and can be abstracted into granular details to be integrated into a larger value set representation of each agent then converge onto a solution to imply the trajectory formation and confirmation of the strategy of the game.

The Kernel system is not a new formula; it is a construction to act as the connective infrastructure between different agents. It is there to ensure that agents align in meaning, momentum or intention as the defining parts of the dynamic convergence. It takes the exponential of the negative influence factor relating to decay over distance multiplied by the undercurrent distance of hidden tension or alignment between them.

**Agent Mapping and Influence Weights**

The agent world is mapped through N agents, and each strategy has a degree k as a proxy for the number of connections. The weights are measured by the number of connections for one agent divided into the maximum connections within the wider network. This is increased by the exponential factor Tau which controls the distribution of the weights and how they can cohesive form selective ‘hubs’ of cumulative influence.

**Edge Accumulation and Local Stabilization**

The edge accumulation measures the accumulated influence at an agent. This is smoothened by the multiplication of the kernel by a log intensity of the intensity of the neighbor payoff added to a scaling factor for how much is felt by the neighbor. This mechanism is to convert any agent complex feedback to stable local information able to be processed without any massive exponential swings of data.

**Competing Global Strategies**  
BTUT also manages two competing global strategies, it takes the sum of both global strategies. It balances the payoff to each respective agent multiplied by the weight of the agent defined in the equation and kernel strength of the agent; referring to the strength of the agent signal compared to others. This summation takes the values generated in these equations and grows it to represent two global comparative forces.

**Momentum and Adaptation**

The second equation complementing this takes the global proportion and averages it to encode the inertia and memory of the movement. Then the second half of the equation encodes the adaptation by showing how many times A beats B or vice versa relating to the strategies. This makes the system smooth out noise and only allows meaningful shifts, going back to BTUT stability through motion principle through this momentum dampening effect.

**Trajectory Update Dynamics**

The trajectory update equation captures the path memory and where the flow went through. If the global proportion increases, trajectory moves positively, and momentum is built towards A and vice versa. The constant is used to control the sensitivity of it to either increase the momentum of the trajectory trend through a large value or decrease it so that motion is constant forward even with small reversals.

**Undercurrent Energy and Equilibrium**

The undercurrent takes the log ratio of both utilities to quantify the perceived imbalance between the two strategies. If the A strategy is greater than the B positive, the energy will flow towards A, and this works vice versa. It works to become a retrofitting of the preference networks reflecting a change in potential energy. These agents accumulate a lot of undercurrents through these discrete changes in energy, and this shows an entirely new layer of charging and discharging underneath. The future shocks will express these undercurrents where this energy is able to be translated.

Equilibrium is represented by the steady state probability to show the entire collective behavior. By raising the rewards, you directly strengthen the cooperation and by raising the costs you weaken it. This shows a balance between the trajectories and undercurrents which have a dynamic convergence instead of the static Nash equilibrium.

**Scalability and Computational Advantage**

This Game Theory scales as every key term depends fully on local neighbor interactions which allows for linear growth with the number of agents. This means there are no PDE bottlenecks, exponential state expansion and it can simulate millions to trillions of agents as it is scale invariant.

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