

## Div 2 Reflection Essay

Overview of Concentration: Now that you have a chance to reflect on your Division II concentration, please summarize it in 1-2 paragraphs. What was the focus of your Division II work? What disciplinary areas does it include, and what topics/issues were of particular interest? What are the interdisciplinary/transdisciplinary aspects of your concentration, and what relevant project-based work did you complete? Note that this section can be descriptive (and may be quoted in your transcript).

It's been awhile since I wrote one of these! What have I done these past 2 years? The most interesting things I've worked on were:

- Simulating economic agents to model land value taxation results in Kenneth Mulder's Agent-Based Modeling class.
- Proposing Continuous-Quadratic Voting systems in Ethan Zuckerman's Defending Democracy in a Digital Age
- Learning about Kolmogorov Complexity in the context of ideal Bayesian inference, forming the foundation for my conception of what intelligence *even is*.
- I trained a transformer model from scratch to predict latency between two arbitrary IPs on the internet, as a base for potential effective peer-to-peer routing.
- I iterated on ideas for my programming language, eventually solidifying what I believe may be a foundation to emulate/replace all other programming languages.

The most important thing I think is the programming language. The core realization I had is that we need a programming language where the type system is apart of the language itself, a first-class object, in order to reason about types themselves. Only then will we likely have the ability to formally verify the behavior of programs and perhaps be able to have truly correct AI programming. (Where the programmer writes a formal specification, and an optimizer produces an implementation that satisfies it).

Reflection on Learning: Reflect on your growth in learning these past four semesters. What skills have you gained, and what do you still want to work on? In your course evaluations, what have professors identified as your strengths and as areas to develop; and how does that fit with your own self-assessment? What projects have you completed that indicate growth in your concentration areas? How have you engaged with inter- or transdisciplinary methods and practices in your Division II work? Consider what the work shows about your growth, about what you have learned, and about the skills you have developed. Discuss what changed in your thinking or your abilities and what caused those changes. Where are you now? What does it mean for your future work?

It is hard to know exactly where I was two semesters ago. I definitely think (hope?) I've matured a socially, from my fair share of mistakes made. My professors identify that I'm always participating in class discussion, and I usually always do, but I think I'm still bad at doing things I'm not interested in, and this comes in practice when it comes to UMass classes where there's usually a lot less flexibility... My biggest gain (and loss) in skill when it comes to my projects (programming) is I think the ability to leverage AI coding agents. I was a pretty early adopter and started leveraging coding models around the time when the first reasoning models came out (o3-mini-high). I have since tried to integrate it into many of my programming efforts, for efficiency and to see what would be needed to gain the efficiency while avoiding the pitfalls. The pitfalls are unfortunately many. The core issue with AI programming is that you are now disconnected from the code and there is less of a pressure/need to understand things on as low a level. This has always happened in programming with people developing higher and higher levels of abstraction, but since you are now interacting not with well-structured high-level APIs but with messy AI output, it is easy to just roll the dice asking the AI to fix a problem than to understand it. I'm not quite as pessimistic about AI as many other people (as I use it every day), but I definitely think we need something more concrete than natural language to describe requirements and constraints, hence my programming language project.

Reflection on Race & Power: Consider how your thinking about race and power developed during Division II. Were there specific assignments, CDL workshops, campus speakers, or student clubs that helped you to better understand how race and power operate within local and global contexts? How did R&P-tagged courses help you understand how methodologies, epistemologies, and academic disciplines are shaped by racism? What kinds of intersectional approaches did you add to your theoretical toolkit? Finally, how did you put your knowledge of Race and Power into practice (e.g. service, leadership, mentorship, and collaboration)?

My current stance is that the most accurate models to think about issues of race and power is the framework of game theory. I think I've previously had this notion, but the details have become more crystalized over time. Race (as well as gender, ethnicity, accent, etc.) are signals that form something called a 'Schelling game' and results in situations where even if participants in the game have the slightest preference for those of similar signals to them, this can tend to form segregated groups, and if such groups had preexisting inequalities, the segregation will exacerbate them. (Which is why antiracism and other forms of power-rebalancing needs to be an active process to fight against the game-theoretical incentives that cause power concentration). This perspective has really solidified my political views when it comes to ideal economic or voting policy (land value taxes, universal basic income, approval voting-based systems), but not as much when it comes to my programming so far. This will possibly come later when I start working on peer-to-peer protocols.

Reflection on Community Engaged Learning (CEL-2): How did you grow as a member of one or more communities over these past four semesters? How did your sense of yourself in relation to others in these communities grow and change? How did your community engagement relate to and contribute to your Division II concentration work (specific projects and/or your Division II work as a whole)? What new questions were raised or interests sparked through your community engagement?

My CEL-2 reflection has more on this, so I will just say here that I presented on 4 topics over the past 4 semesters at UMass's Philosophy and Open Thought Club: Emotivism, Georgism, AI existential risk, and Game Theory.

Division III Plans: What are your plans for Division III? How has Division II prepared you for this work?

My Div III plans are to continue working on the follow: My LLM cultural research with Ethan Zuckerman, my programming language project, and ideally my latency-prediction project, or depending on if my programming language becomes usable at that point, try to actually start developing peer-to-peer protocols. I can dream!