Teaching Statement Woven with Research Strings

I always find the opportunity to write a statement intriguing as it allows me to express my ideas about teaching and research. Engaging in academic discussions has been a passion of mine, as it enables me to pursue knowledge and validate it through interactive feedback. Having served in academia in a teaching role for three years following the completion of my Ph.D., I strongly believe in the value of feedback for human learning and continuous progress through research.

In the established curriculum, I consider the undergraduate period as a time for reconstructing established knowledge and assimilating its philosophy. Consequently, I aim to prepare myself to assist undergraduate students in comprehending these concepts. Practical application and the ability to reconstruct knowledge are crucial aspects in testing and reinforcing understanding. I am driven by the ambition to help others observe and appreciate these concepts, which I believe are fundamental in developing effective teaching skills for undergraduate studies.

In the realm of computer science (CS), information technology (IT), and artificial intelligence (AI), applied knowledge holds paramount importance. To stay updated with the rapid developments in CS and AI, I equip myself with hands-on skills necessary to guide students effectively.

I have taught many course to undergraduate students focusing on AI within the curriculum. Among these were two conventional courses: 'Introduction to AI' and 'Image Processing.' Additionally, I developed a specially designed course titled 'Parallel Computing using Graphical Processing Units (GPU),' conceptualized by myself. This course delved into core parallel programming concepts, emphasizing execution on GPUs. It aimed to equip undergraduates with essential skills for contemporary AI and deep learning development.

These courses served as platforms to explore AI applications and prototype development for scaled final-year undergraduate projects. Moreover, I provided consistent supervision for final-year projects, which encompassed the creation of an AI Fitness Coach, smart glasses, and an AI municipality support agent.

My research in AI, particularly in the realm of autonomous vehicles, has been instrumental in keeping me at the forefront of advancements in this field. Autonomous vehicles have served as a crucial testbed for AI developments spanning over seven decades, encompassing cybernetics, computer vision, image processing, and more recently generative modeling.

Through my research, I've actively applied cutting-edge methodologies to advance self-driving vehicle technology. As part of our team efforts, we successfully demonstrated an SAE Level 3 autonomous vehicle. My research positions have been pivotal in keeping me aligned with the rapid growth and evolution of AI, aligning perfectly with my philosophy regarding the undergraduate curriculum

Graduate studies delve deeper into knowledge domains, challenging existing paradigms and fostering interventions. These interventions intricately engage with and build upon the foundational beliefs constructed during the undergraduate period of knowledge reconstruction. Engaging with graduate students in this context becomes an intriguing exercise for me, involving the practice of constructive interventions. It's an opportunity to recalibrate my understanding, challenge the existing state-of-the-art, and engage in robust discussions within the graduate curriculum.

The graduate curriculum is designed to equip students with the critical skills necessary to intervene effectively and persuasively present their observations. In my capacity, I've instructed recently three courses for graduate students: 'Deep Learning,' 'Advanced Database Concepts,' and 'Advanced OS Concepts.' These courses were meticulously designed to stimulate the inquisitive nature of graduate students by discussing cutting-edge concepts within the field and culminating in each student presenting a definitive position statement that encapsulates the strategies learned. Additionally, I've played a role in co-supervising master's students' theses and actively participated in thesis defense committees, contributing to the holistic learning experience of graduate students.

Recent strides in AI have demonstrated that revisiting old ideas with enhanced computational power and a broader scope of data yields remarkable outcomes. However, these advancements also usher in new challenges previously unseen in the field of AI, notably pertaining to AI safety, interpretability and alignment. Among the domains affected by these developments, autonomous vehicles stand out, given their pivotal role in post-industrial era societal advancements.

In my recent research, I've concentrated on optimizing the cost-effectiveness of autonomous vehicles, focusing specifically on utilizing only camera vision for perception and planning modules. Unlike human vision, which serves as a passive sensor influencing activity planning, autonomous vehicles rely on active sensors, often costly and prone to errors. This research direction allows me to strategize methods to bridge the gap between undergraduate and graduate studies, fostering discussions on intervention-driven knowledge with graduate students.

Post-graduate studies serve as an extension of my learning journey, akin to a multi-arm bandit strategy, where testing interventions against alternatives leads to innovative problem-solving. Within the post-graduate curriculum, students cultivate ideas seeded during prior studies, nurturing them through erudite discussions and deeper exploration. This phase equips individuals with scholarly skills essential for evaluating interventions and fostering innovative solutions.

In this realm, the audience expands, transforming critics into competitors. Discussions now involve iterative validations and the pruning of ideas, substantiated by concrete evidence. A steadfast belief in resolving complex AI challenges has fueled remarkable progress in the past decade. Deep learning and artificial neural networks stand as the cornerstone of nearly every AI application. My current work focuses on leveraging deep learning for end-to-end perception and planning in autonomous driving, utilizing camera vision and vehicle control data. This ongoing research not only allows me to evaluate interventions but also harnesses the invaluable time and skills of post-graduate students, fostering an environment conducive to mutual knowledge extension and skill enhancement in the realm of AI.

The process of learning and revising learning methodologies remains a perpetual journey, complemented by supplementary activities within teaching institutions that aid in refining strategies tailored to specific environments. I wholeheartedly embrace constructive feedback from both students and educational systems as it enables me to continuously enhance my skills, fostering a conducive learning environment within the school.

Beyond my obligatory commitments within the educational realm, I strongly believe in the societal obligations of academia. It provides a perpetual platform, existing in a continuous present tense. An instructor is consistently in a teaching mode, transitioning to a learning mode intermittently. I firmly

believe that educators can traverse through time—drawing lessons from the past, adapting in the present, and envisioning future contributions to society.

In this spirit, I conceptualized and designed a summer school program catering to young students in grades three to seven. Through engaging discussions centered around the current state-of-the-art in AI, these students were immersed in concepts beyond their immediate understanding, providing them a glimpse into the past. This invaluable experience allowed me to comprehend aspects of the learning process and the relative translation of knowledge.

A concise learning, research, teaching and service statement is, ”I serve as a teacher to carry out research for my learning.”

I asked GPT to convert in to a rhyme and here it goes:

In the symphony of my endeavors, a succinct verse echoes:

'I serve as a teacher, a seeker in research, a learner in quest.'

In each moment's dance, I don the robe of a guide,

Charting paths through realms of knowledge, my eager stride.

A maestro weaving threads of inquiry and insight,

Each teaching a canvas, each study a starry night.

For in this eloquent tango of knowledge's embrace,

I am both the pupil and the teacher, a boundless space.

Thus, in service, I am a vessel for wisdom's yearn,

As I delve into realms unknown, it's to knowledge I return.