



Sciences

Session 4: Thursday, June 6, 1:45–3:15 p.m.

“Pedagogy and Practice in an Open-source, AI World”

Location: Pembroke

John Lewis, *Lipscomb University*, Moderator

- **Sarah Parker**, *University of North Carolina at Chapel Hill*
- **Juan Rojas**, *Lipscomb University*
- **Finney Premkumar**, *University of Birmingham*

In this session on the sciences the power of collaboration using open-source software to facilitate science communication and two perspectives on artificial intelligence will be explored. Please join us for a timely discussion!

Sarah Parker, *University of North Carolina at Chapel Hill*, “Empowering Collaboration through Open-Source Tools, Education, and Effective Communication”

Scientific research often involves experts compartmentalizing themselves and their discoveries into their own fields of expertise. This makes interdisciplinary collaboration more difficult, and makes scientific findings more likely to be inaccessible and misunderstood by the wider community. Yet, in a current world filled with frequent crises, a broad understanding and trust in science is crucial. My research focuses on closing this gap between complicated scientific findings and general public understanding in two main ways. First, I am developing and using open-source, user-friendly software tools to visualize and interpret complex data, specializing in genomics. Second, I am developing and implementing educational programs to teach coding and data science skills to a wide range of learners, from high school and graduate students to university faculty and working professionals. Through the use of these software tools and educational programs, we are not only promoting collaboration between scientists of varied career and educational backgrounds; we are also making new scientific findings more available to a wider audience by ensuring that these initiatives establish clear, visually engaging ways to communicate scientific data. Through these programs, scientific research will become more efficient, effective, and accessible, but this is about more than just advancing scientific research. It’s about creating a world where science is a collaborative, understood, and trusted part of daily life, enabling hope and resilience especially in times of global challenges.

Juan Rojas, *Lipscomb University*, “Exploiting the World of Symmetry to Accelerate Artificial Intelligence”

This talk will present methods by which Artificial Intelligence and robots decision making is being sped up. Imagine a robot learning new tasks in minutes rather than hours or days. The foundational principles used here come from group theory – the area of mathematics that helps us understand symmetry and transformations. By identifying and using symmetries in the environment, agents learn from their experiences much faster. This involves a technique called equivariant learning, where symmetries give

the robot the ability to multiply a single experience. We share how equivariant learning can be systematically used to speed up the agent learning and produce more robust and adaptable policies. The impact of the work promises more efficient and sustainable learning with greater learning outcomes making the agents more versatile and capable partners in a variety of settings.

Finney Premkumar, *University of Birmingham*, “The Imago Dei: Why Artificial General Intelligence (AGI) will never replicate a Human Person”

Artificial General Intelligence (AGI) has become a subject of much interest and discussion recently. I wish to maintain that the development of AGI and the associated existential risks are a non-existent problem. Regardless of the undeniable strides that AI research has achieved, it’s not a matter of increased complexity but one of principled impossibility from a Christian standpoint. I will forward two arguments that will converge on the inevitable conclusion to support my position in this paper. First and foremost, the difference between humans and machines is not merely a difference in degree but a difference in kind. Secondly, in order for AI systems to replicate and not merely simulate human agents there must be an identifiable subjective state. A state of what it feels like to be in that state. In order for this to be exemplified there must be more than the accumulation of physical states. Consciousness is to some extent this transcendent state that is not identifiable with any purely physical constitution. This qualitative difference is to be expected in a reality created by a Divine Being since the effect exemplifies characteristics of the cause. Finally, I wish to conclude that from a Christian paradigm what makes us human is the “Imago Dei”. Accordingly, as long as we cannot create or transfer the image of God to machines, any proposed equality of Being between the two will remain a mere proposal and not an actual instantiation. All in all, AGI seems to be a principled impossibility.