

# Caleb Schultz Kisby

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**Position:** Doctorate Intern in Machine Learning and Reasoning

Dear HRL Laboratories hiring team,

Hi, I'm Caleb, a 5<sup>th</sup> year PhD candidate at Indiana University. I specialize in integrating neural networks and symbolic reasoning (aka Neuro-Symbolic AI) — so I'm excited to see that you are looking for a PhD intern to do just that. This seems like a great fit, and so I'm here to apply.

I have 6 years of experience (4 PhD + 2 undergrad) working on research projects and proof-of-concept prototypes. I've published and presented 3 papers in AI conferences (one in AAAI!), and I'm currently targeting KR for a fourth paper. My work synthesizes deep learning with symbolic reasoning; every neural network architecture I've designed incorporates knowledge in some way. During my PhD, I have had hands-on experience with: writing Python code that uses Tensorflow, as well as writing code for reinforcement learning systems. My most recent project is a Python suite (using Tensorflow) to both verify if a neural network satisfies P and to build neural networks satisfying P. (See the Projects on my resume for more details.)

Unlike most machine learning researchers, I have a particularly strong background in formal logic and proofs. In fact, I've spent much of my PhD proving soundness and completeness for both a natural language-inspired logic, and also a formal neuro-symbolic translation. (See the Publications on my resume for more details.)

If you are interested, I'm available for a phone or Zoom interview during normal business hours (8am–6pm, EST) — please email me at the address above to schedule a time.

Thank you for your consideration,

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