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Project Title	Using virtual reality techniques to investigating interactions between fully autonomous vehicles and vulnerable road users	
PI (Up to 2)	Samuel Labi	Sikai Chen
Telephone #	(765) 494-5926	(765) 494-5926
E-mail:	labi@purdue.edu	chen1670@purdue.edu
Institution:	Purdue University	Purdue University
Department:	Lyles School of Civil Eng.	Lyles School of Civil Eng.
Industry or Government Principal, organization, and contact information	Dr. Barry Partridge Director, Research and Development, Indiana Department of Transportation, 1205 Montgomery Street, West Lafayette, Indiana 47906, (765)463-1521, bpartridge@indot.in.gov	
Most relevant CCAT research thrusts (choose all applicable)	<input type="checkbox"/> Control & Operations <input checked="" type="checkbox"/> Enabling Technology <input checked="" type="checkbox"/> Human Factors <input type="checkbox"/> Infrastructure Design & Management <input type="checkbox"/> Modeling & Implementation <input type="checkbox"/> Policy & Planning	
Funding Request	\$75,000	
Matching Funds and Source (if any)	\$75,000 (Indiana DOT \$25,000; Chang An University \$50,000)	
Total Project Cost	\$150,000	
Contract Number	69A3551747105	
Project start/end dates	01/01/2021 - 09/30/2022	
Project Abstract	<p>Fully autonomous vehicles (FAV) or Level 5 automation vehicles can perform driving tasks in any environment and under all conditions without input from human drivers. However, they can lead to other challenges during real world implementation. Specifically, communication methods between vulnerable road users (pedestrians, bicyclists) and FAVs may change ultimately, which may lead to misunderstanding of intentions and cause more collisions. When road-users enter the road network, they initiate a constant exchange of information with the traffic environment and other road-users around them in order to be ready to respond immediately. Road-crossing pedestrians and bicyclists generally rely on informal communication methods, eye contact, facial expression and gestures, to interpret intentions of other road users and make</p>	





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	<p>decisions based on the information. With FAVs, these informal communication approaches cannot be realized. Hence, it is necessary to understand the interactions between these road users and FAV and design proper external features of FAV to establish efficient communication method. This project intends to expose participants to simulated testing environments with virtual reality headset and identify potential interface designs for FAV-pedestrian interaction. With pre-experiment collection of participants' socio-demographic data, and behavioral measurements during the experiment, pedestrians' attributes and factors that influence their road-crossing behavior and trust of AVs will be investigated.</p>
High-level implementation plan	The research team intends to collaborate with Indianapolis city authorities to test the implementation of the proposed research product.
Project Metrics	<ul style="list-style-type: none"> • Number of papers presented at nationally and internationally renowned conferences • Number of journal papers published • Number of graduate student theses • Media stories and website hits • Number of public outreach events
Web Links: [leave blank until project approval]	<p>ccat.umtri.umich.edu https://engineering.purdue.edu/ccat https://www.purdue.edu/discoverypark/cav/nextrans/index.php</p>

