

عنوان مقاله:

Web Application Testing Using Deep Reinforcement Learning

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خلاصه مقاله:

Web applications (apps) are integral to our daily lives. Before users can use web apps, testing must be conducted to ensure their reliability. There are various approaches for testing web apps. However, they still require improvement. In fact, they struggle to achieve high coverage of web app functionalities. On the one hand, web apps typically have an extensive state space, which makes testing all states inefficient and time-consuming. On the other hand, specific sequences of actions are required to access certain functionalities. Therefore, the optimal testing strategy extremely depends on the app's features. Reinforcement Learning (RL) is a machine learning technique that learns the optimal strategy to solve a task through trial-and-error rather than explicit supervision, guided by positive or negative reward. Deep RL extends RL, and exploits the learning capabilities of neural networks. These features make Deep RL suitable for testing complex state spaces, such as those found in web apps. However, modern approaches support fundamental RL. We have proposed WeDeep, a Deep RL testing approach for web apps. We evaluated our method using seven open-source web apps. Results from experiments prove it has higher code coverage and fault detection than other existing methods

کلمات کلیدی:

Deep reinforcement learning, Automated testing, Test generation, Web application

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