MULTIMODAL EXPLAINABLE AI

Trevor Bonjour

tbonjour@purdue.edu

PURDUE UNIVERSITY® | Department of Computer Science

User Query

Multimodal Data

Feature Extraction

Classifier

Results with Ranking
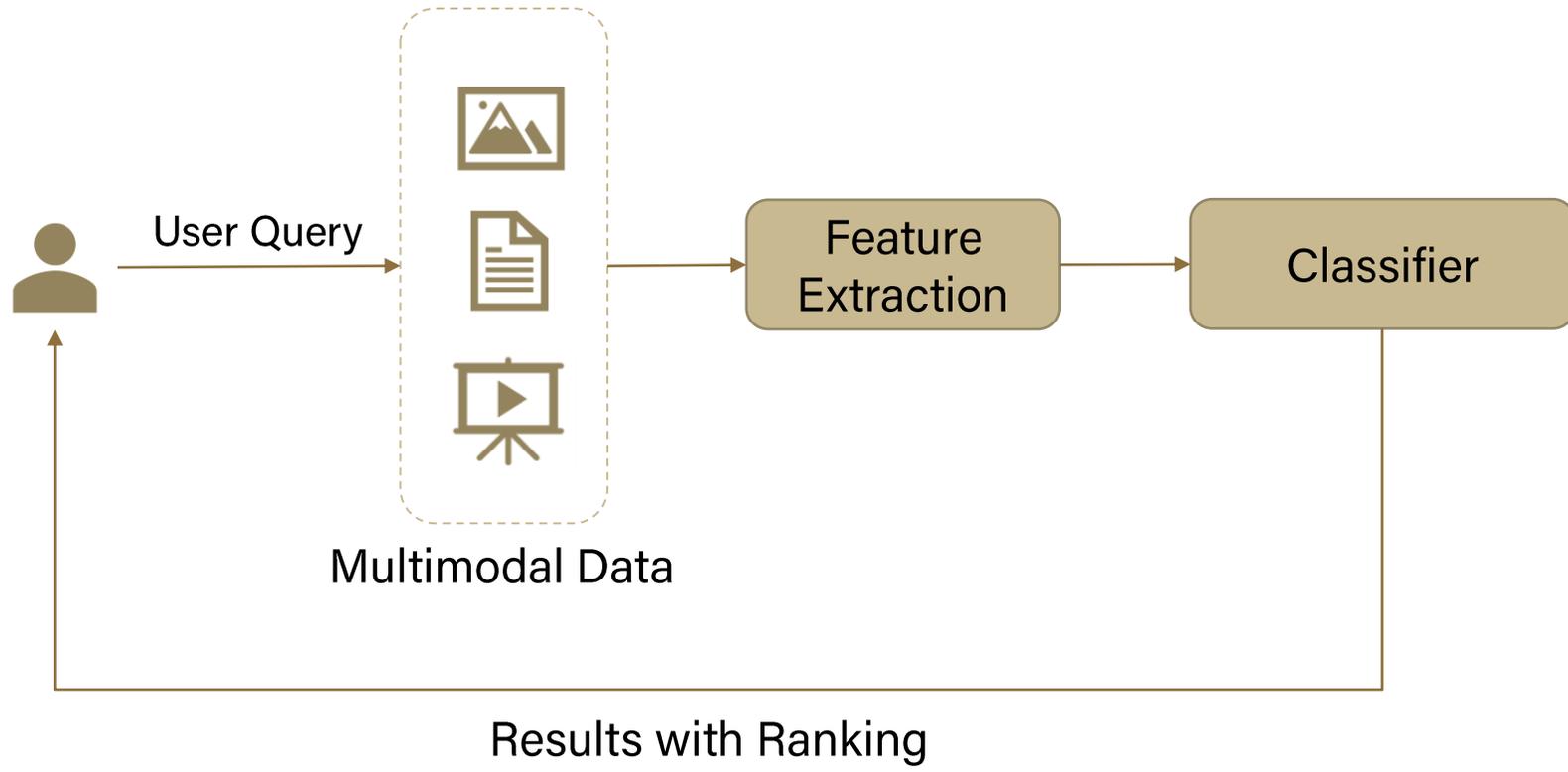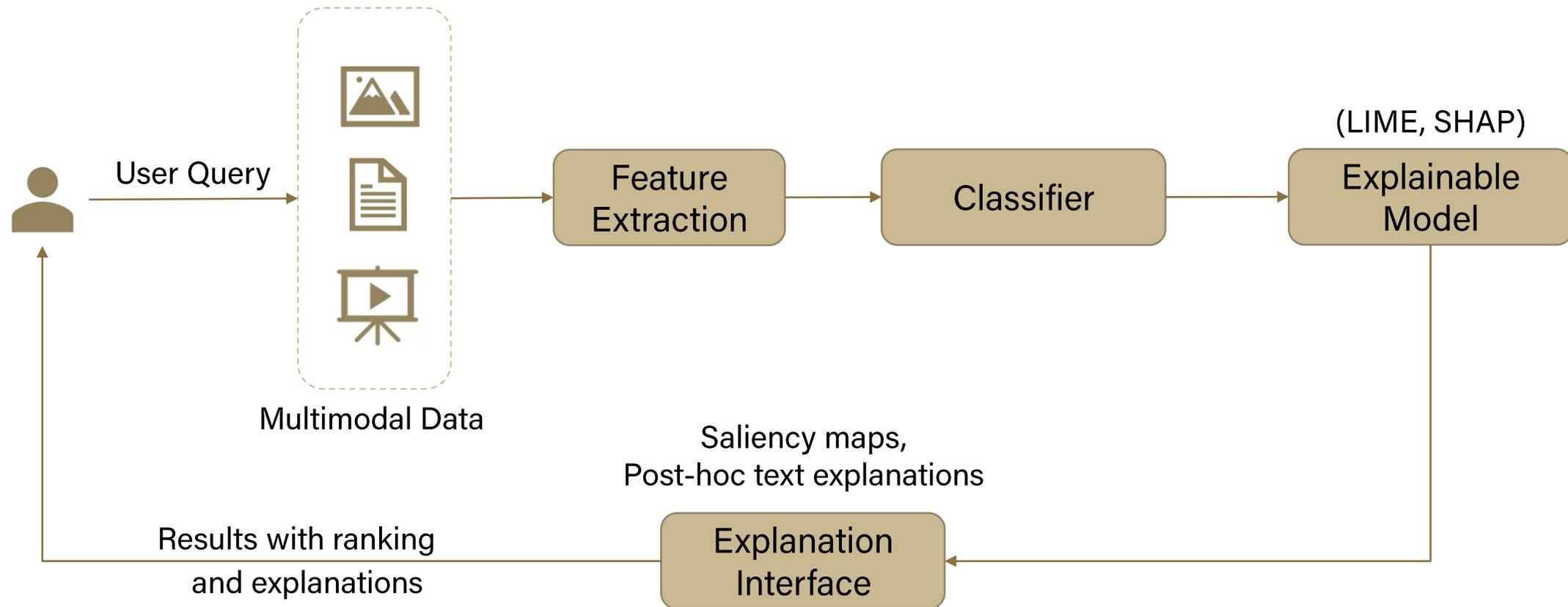
Multiple modalities provide complementary explanatory strengths.

Visual Question Answering

- Explanations can be integrated with a question answering system to provide justifications

- In case of conflict between different classifiers, explanations become critical

Is there congestion at Checkpoint A?

I cannot be confident either way, sorry.

Why?

Live CCTV shows 2 moving objects at 80% of the speed limit which indicates it is not congested. But the live CCTV image is classified as congested.

These outcomes are inconsistent.

The green areas show the parts of the image that most indicate congestion.

References

- Miller, Tim. "Explanation in artificial intelligence: Insights from the social sciences." arXiv Preprint arXiv:1706.07269. (2017)
- Ribeiro, Marco Tulio, Sameer Singh, and Carlos Guestrin. "Why should I trust you?: Explaining the predictions of any classifier." Proceedings of the 22nd ACM SIGKDD international conference on knowledge discovery and data mining. ACM (2016)
- Shapley, Lloyd S. "A value for n-person games." Contributions to the Theory of Games 2.28 (1953): 307-317
- Lundberg, Scott M., and Su-In Lee. "A unified approach to interpreting model predictions." Advances in Neural Information Processing Systems. (2017)
- Braines, Dave, Alun Preece, and Dan Harborne. "Multimodal explanations for ai-based multisensor fusion." NATO SET-262 RSM on artificial intelligence for military multisensor fusion engines. NATO (2018).

PURDUE UNIVERSITY® | Department of Computer Science

THANK YOU

PURDUE UNIVERSITY® | Department of Computer Science