

DEFAME

Dynamic Evidence-based FAct-checking with Multimodal Experts



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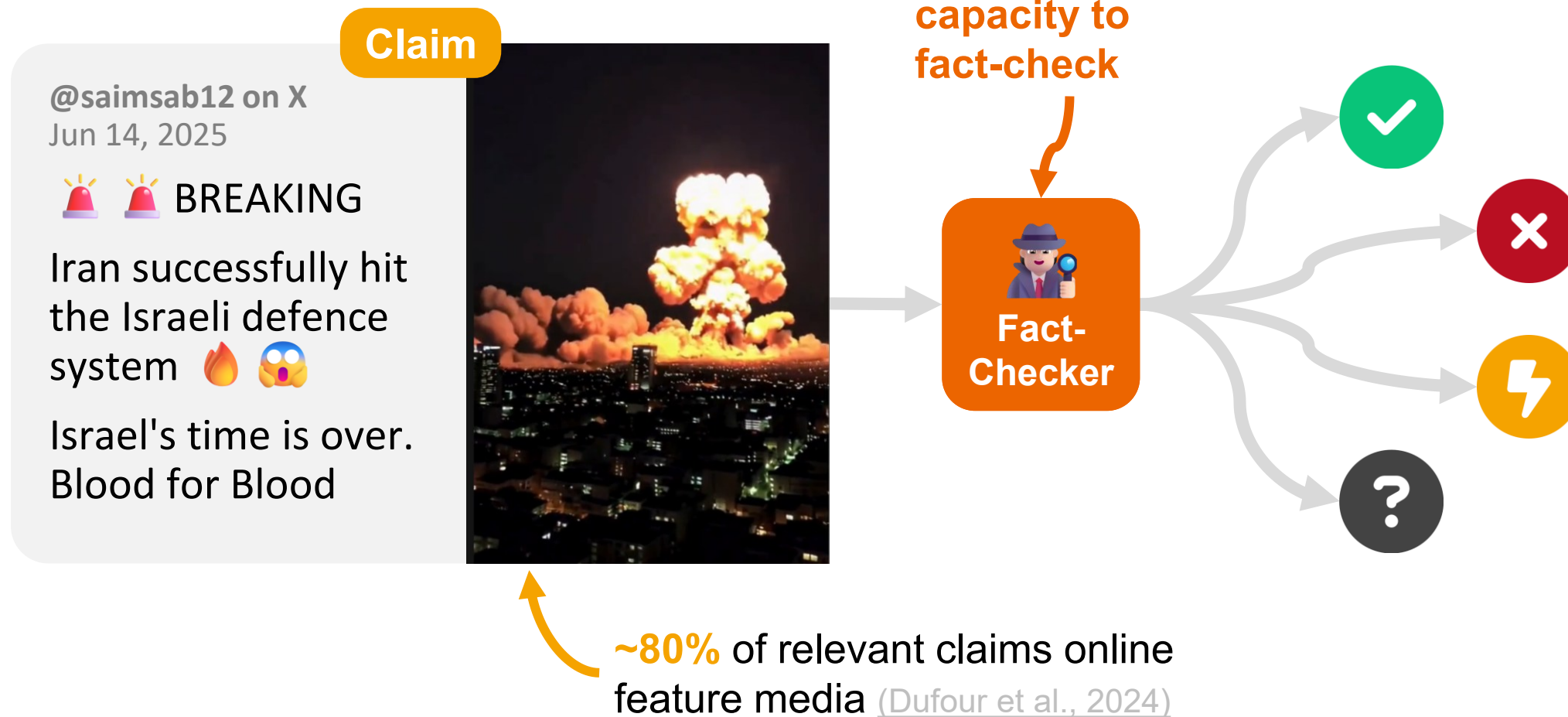


Anna Rohrbach

*Equal contribution

Motivation

Automate Multimodal Fact-Checking



Text only



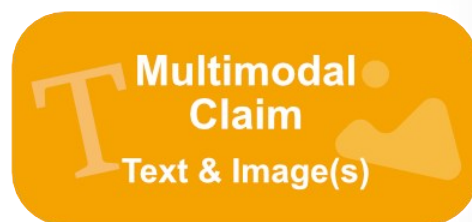
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Method	Multimodal claims Multimodal evid. Evidence retrieval Multi-hop Planning Tools Reasoning Explainable Training-free Open-domain	Backbone
RAGAR (Khalig et al., 2024)	✓ - ✓ ✓ - - ✓ ✓ ✓ - -	MLLM
MMD-AGENT (Liu et al., 2025)	✓ - ✓ - ✓ - - ✓ ● ✓ - <input checked="" type="checkbox"/>	MLLM
SNIFFER (Qi et al., 2024)	✓ - ✓ - - - ✓ ✓ ✓ - - <input checked="" type="checkbox"/>	VLT & LLM
MMOOC-CHECKER (Xu et al., 2024)	✓ - ✓ - - - - - - - -	VLT
VO-HOANG ET AL. (Vo-Hoang et al., 2024)	✓ - - - - - - - ✓ -	LLM & VLT
ZENG ET AL. (Zeng et al., 2024a)	✓ - - - - - - - ✓ -	MLLM
CHASMA (Papadopoulos et al., 2024b)	✓ - - - - - - - ✓ <input checked="" type="checkbox"/>	CLIP & VLT
AITR (Papadopoulos et al., 2024a)	✓ - - - - - - - ✓ <input checked="" type="checkbox"/>	VLT
HAMMER (Shao et al., 2023)	✓ - - - - - - - ✓ <input checked="" type="checkbox"/>	BERT & ViT
MULTIMD (Fu et al., 2024)	✓ - - - - - - - - -	VLT
LVL4M4FV (Tahmasebi et al., 2024)	- ✓ ✓ - - - - ✓ ● ✓ ✓ <input checked="" type="checkbox"/>	(M)LLM
MOCHEG (Yao et al., 2023)	- ✓ ✓ - - - - ● - ✓ <input checked="" type="checkbox"/>	VLT
METASUM (Chen et al., 2024)	- ✓ ● - - - - - ✓ -	VLT & LLM
M ³ D (Tang et al., 2024)	- ✓ - - - - - - -	VLT & GCN
CHARTBERT (Akhtar et al., 2023a)	- ✓ - - - - - - -	BERT
PACAR (Zhao et al., 2024)	- - ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ -	LLM
HiSS (Zhang & Gao, 2023)	- - ✓ ✓ - - ✓ ✓ ✓ ✓ -	LLM
PROGRAMFC (Pan et al., 2023)	- - ✓ ● ✓ ✓ ● ● ✓ ✓ <input checked="" type="checkbox"/>	LLM
SELF-CHECKER (Li et al., 2024c)	- - ✓ - ✓ - ✓ ● ✓ ✓ -	LLM
FACTLLAMA (Cheung & Lam, 2023)	- - ✓ - - - - - ✓ -	LLM
CFR (Sriram et al., 2024)	- - ✓ - - - - - ✓ -	BERT & LLM
DEBERTA (Cao et al., 2023)	- - - - - - ✓ ● ✓ ✓ -	LLM
DEFAME (Ours)	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ <input checked="" type="checkbox"/>	MLLM

DEFAME Approach Overview

First to handle claims and evidence that *both* are multimodal.

Output: transparent, comprehensive **Report**.



DEFAME
6-stage MLLM
pipeline



Fact-Check Report

Claim



"Image shows grounds covered with garbage after the end of Glastonbury Music Festival in 2015."

Actions

🔍 Reverse Image Search, 🔍 Web Search

Evidence

The Glastonbury Music Festival in 2015 involved extensive cleanup [...]. Articles from [Huffington Post](#), [...]



Elaboration

Actions



Verdict



Supported

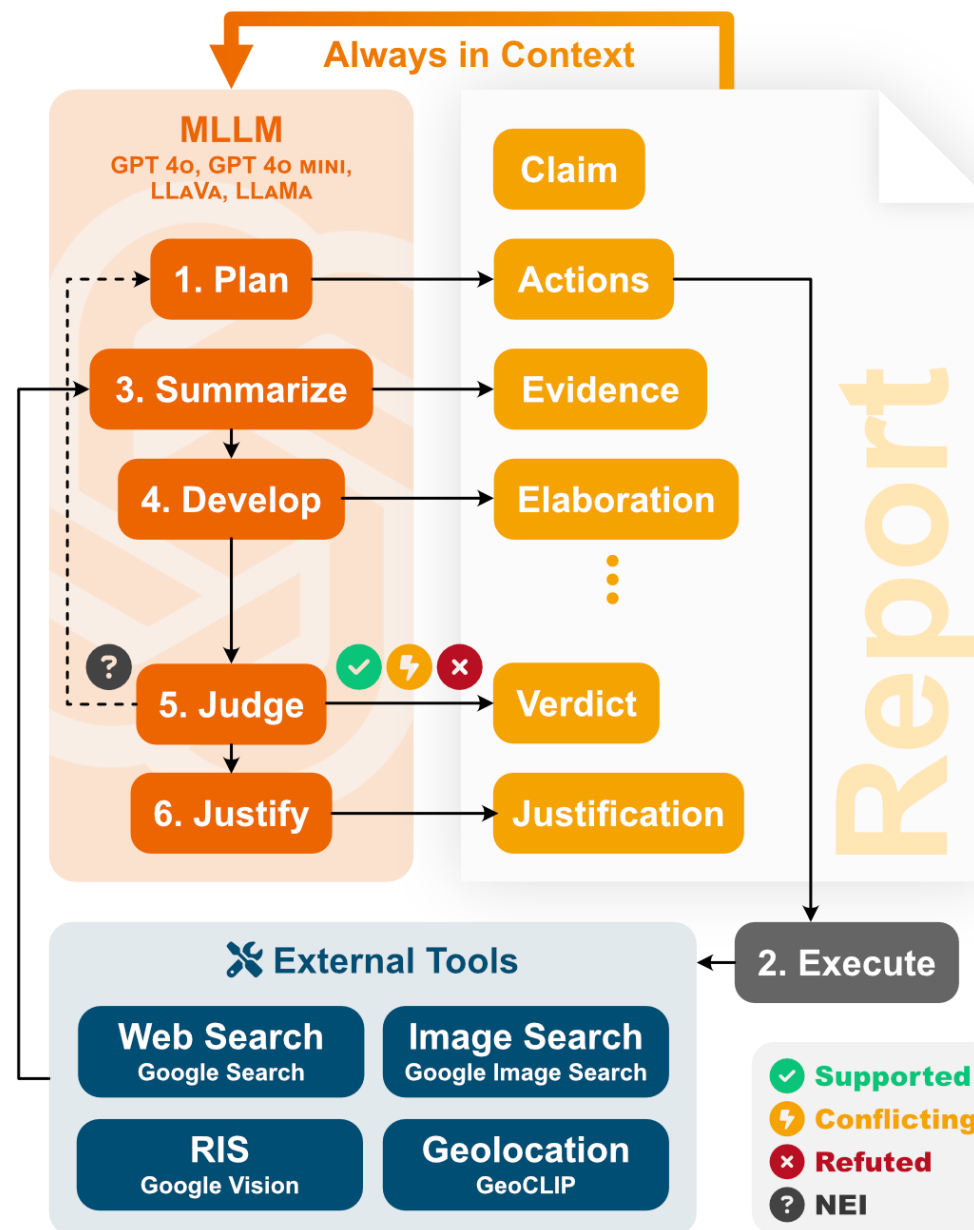
Justification

The image accurately depicts the aftermath of the Glastonbury Music Festival in 2015, confirmed by a reverse image search and multiple credible sources, including [BBC News](#) and [The Huffington Post](#).

DEFAME Approach

6-Stage MLLM Pipeline

- **Report** = multimodal, LLM-readable document
- **Training-free MLLM** backbone
- **Extensible Tool** suite for evidence retrieval



Benchmark ClaimReview2024+

- Multimodal fact-checking dataset
- 300 claims from real-world fact-checks
- **After GPT-4o knowledge cutoff date (Oct 23)**



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Feb 21, 2024

97% of all guns are in the red territory



97% of all gun violence is in blue

"That map shows areas of the United States with high rates of gun violence vs. areas of the map with high rates of gun ownership."

Refuted

X user
Dec 11, 2024



"A picture shows Syria's former president Bashar al-Assad in Moscow with American conservative political commentator Tucker Carlson."

Refuted

Rishi Sunak

Sep 4, 2024

"The Prime Minister inherited the fastest growing economy in the G7."

Misleading

One X user

Aug 12, 2024



"A Russian textbook claiming former U.S. President Donald Trump lost the 2020 presidential election due to voter fraud"

Supported

Jeffrey Goldberg

Oct 25, 2024

"In 2020, Trump said to two people in a private conversation at the White House: 'I need the kind of generals that Hitler had.'"

NEI

X account @TRobin...

Sep 16, 2024



"Louis Armstrong drawing on a fan's forehead."

Supported

Weibo users

Jun 26, 2024



"US Moon landing is staged."

Refuted

Facebook users

Nov 10, 2024

"Impact of human-induced CO2 is insignificant when compared to natural climate variations."

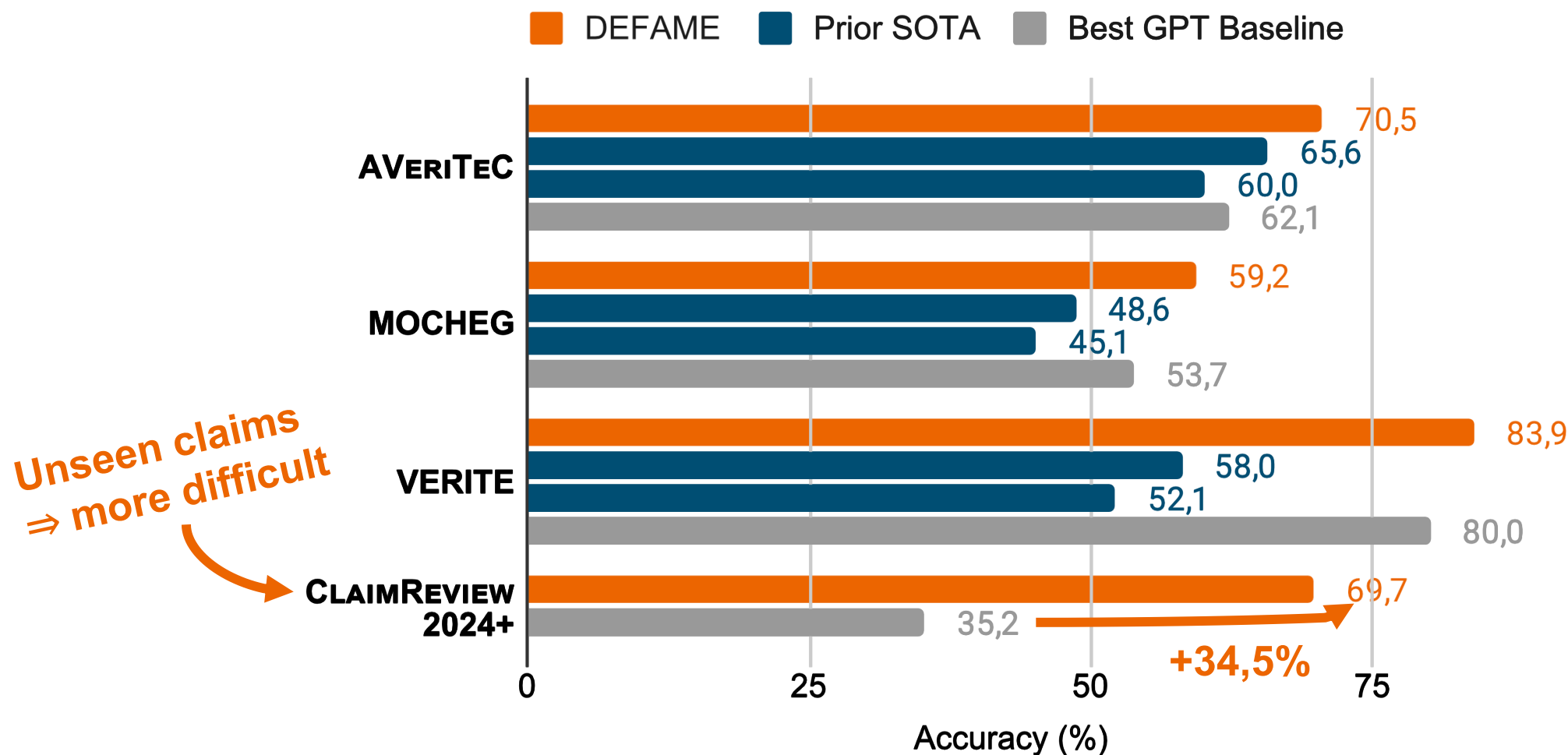
Refuted

Results

DEFAME Surpasses All Previous SOTA Methods

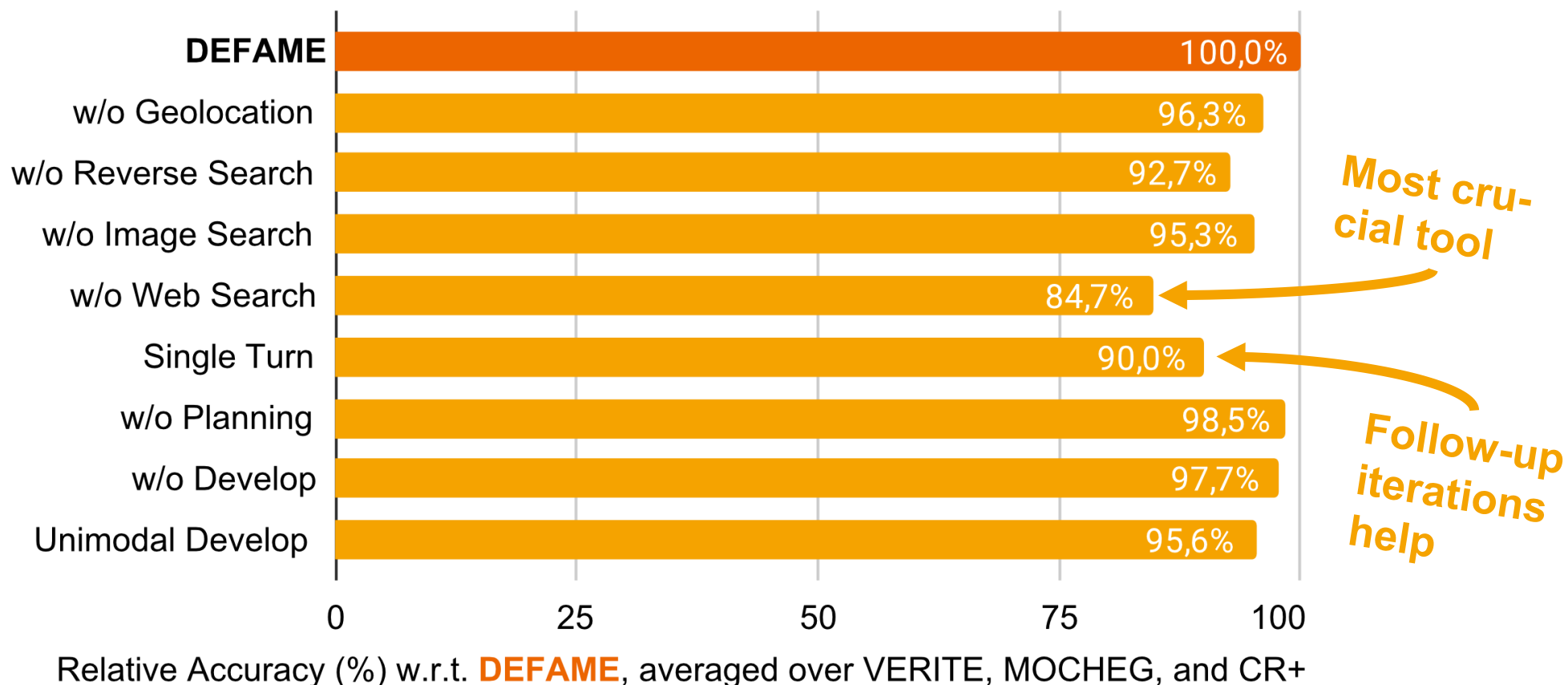


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Results

Ablation Study





Thank You!

