An Investigation of Online Reverse Engineering Community Discussions in the Context of Ghidra

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SP^2

SECURITY. PRIVACY. PEOPLE

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SOFTWARE REVERSE ENGINEERING

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hackerone

bugcrowd

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Malware Analysis

30 students and RE professionals took ~39 minutes on average to reverse engineer decompiled code snippets with <150 lines

Yakdan et al. 2016

TOOL SUPPORT

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Many sophisticated tools

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- Limited adoption

Hafiz and Fang 2015
Votipka et al. 2018

RESEARCH QUESTIONS

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- Significant attention at security conferences and in the press

DATA COLLECTION AND CLEANING

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All Ghidra posts for the 6 months after announcement

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StackExchange

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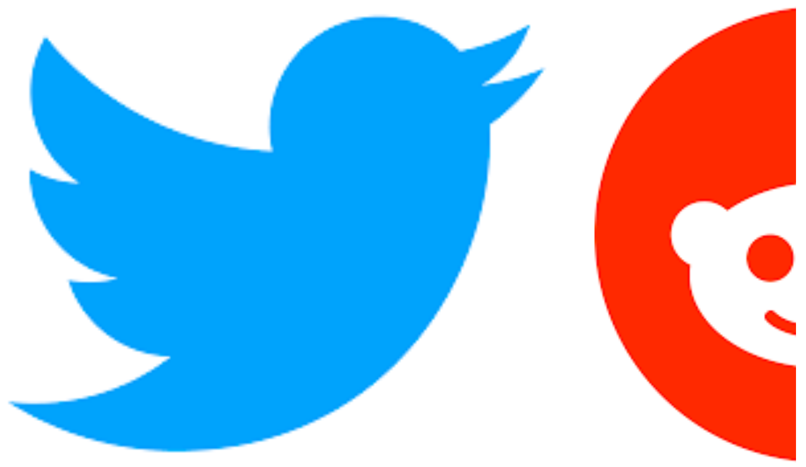

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DATA COLLECTION AND CLEANING

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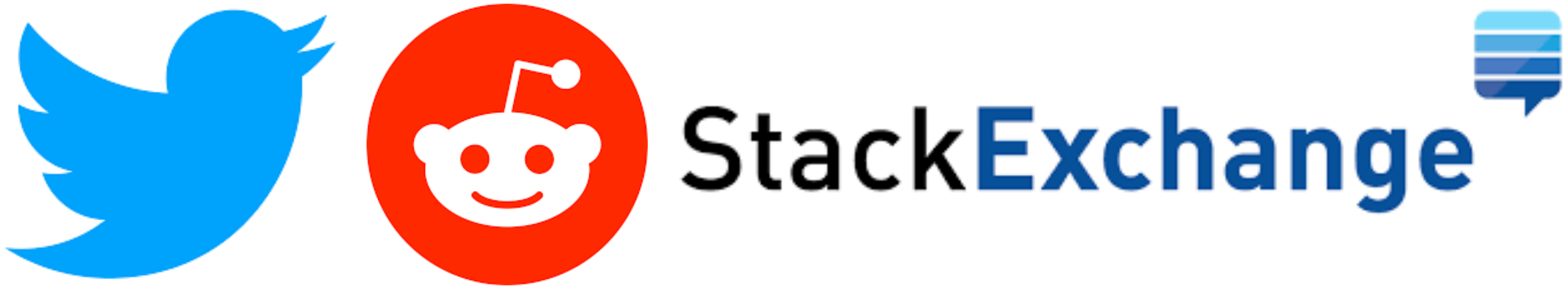

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DATA COLLECTION AND CLEANING

All Ghidra posts for the 6 months after announcement

StackExchange

230 **62** **51**

- Only included direct discussions of Ghidra features

QUALITATIVE ANALYSIS

Two independent coders using existing codebooks

Features

- Codebook based on issue labels in Ghidra Github repo

Conversational Act

- Main reason for the thread
- Type of discourse act for each comment

Collective Sensemaking

- Community members share information and build knowledge together

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Identify expressed user needs

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Decompiler was the most discussed current tool (5%)

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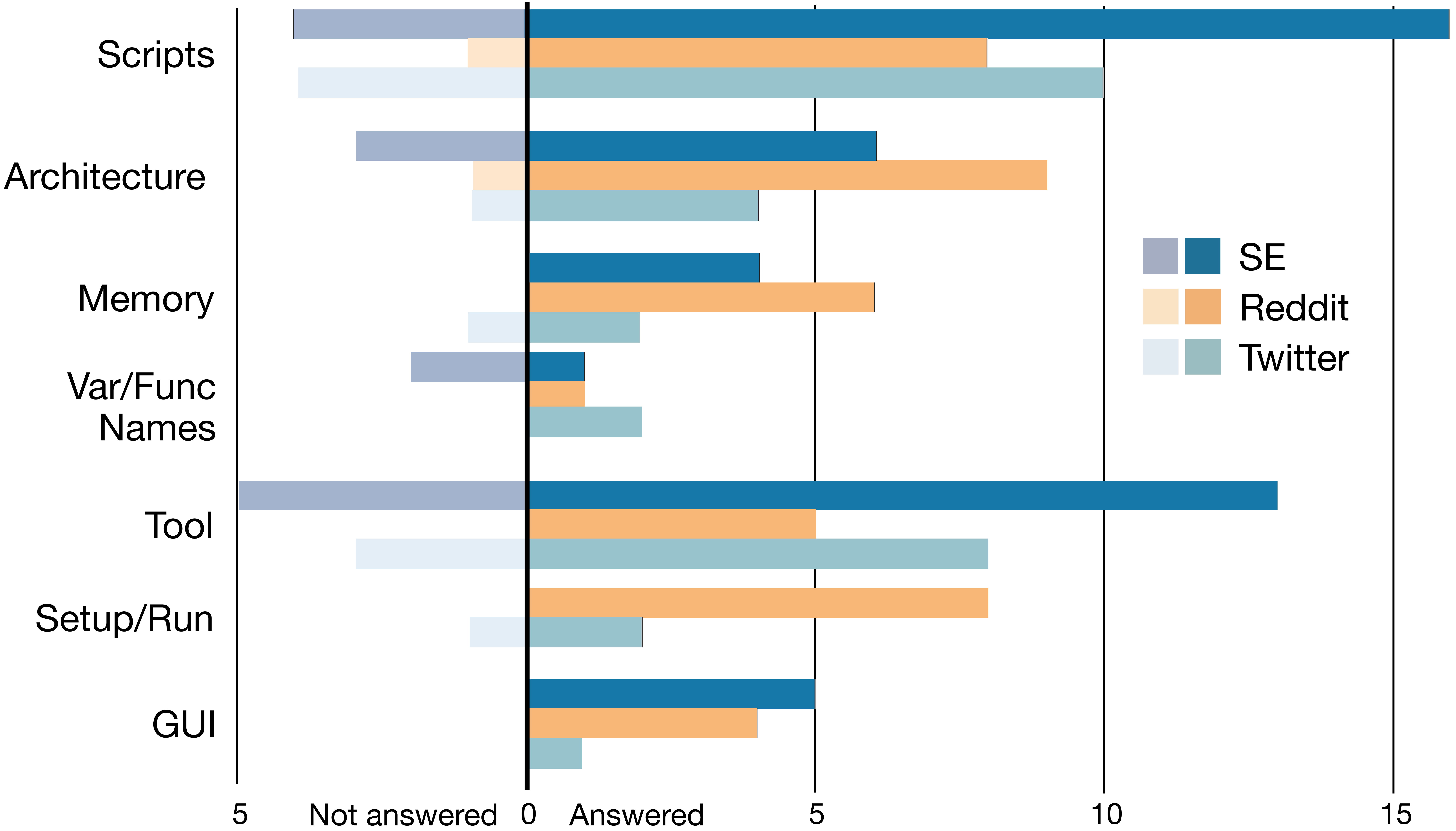
QUESTION ANSWERING



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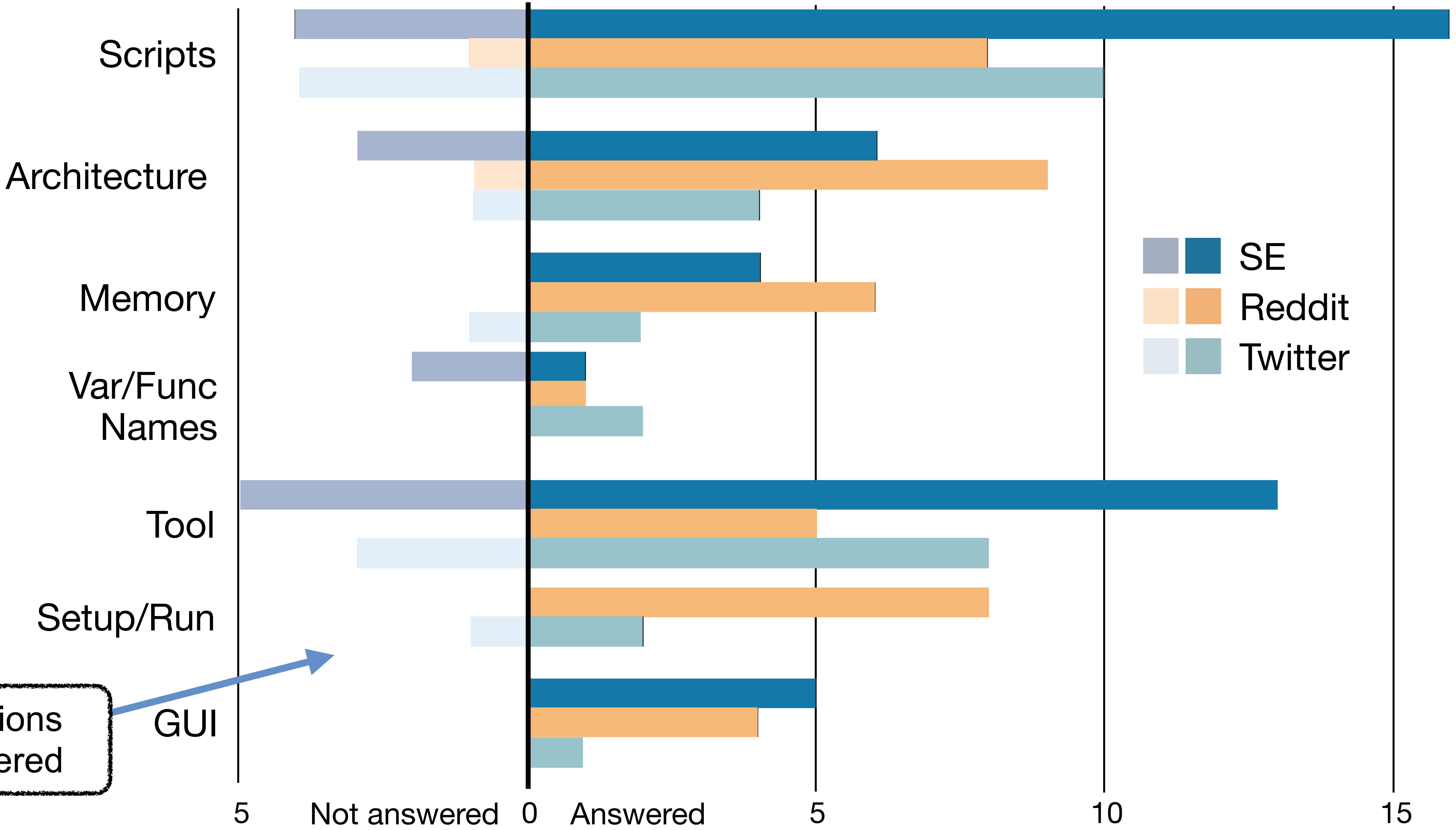
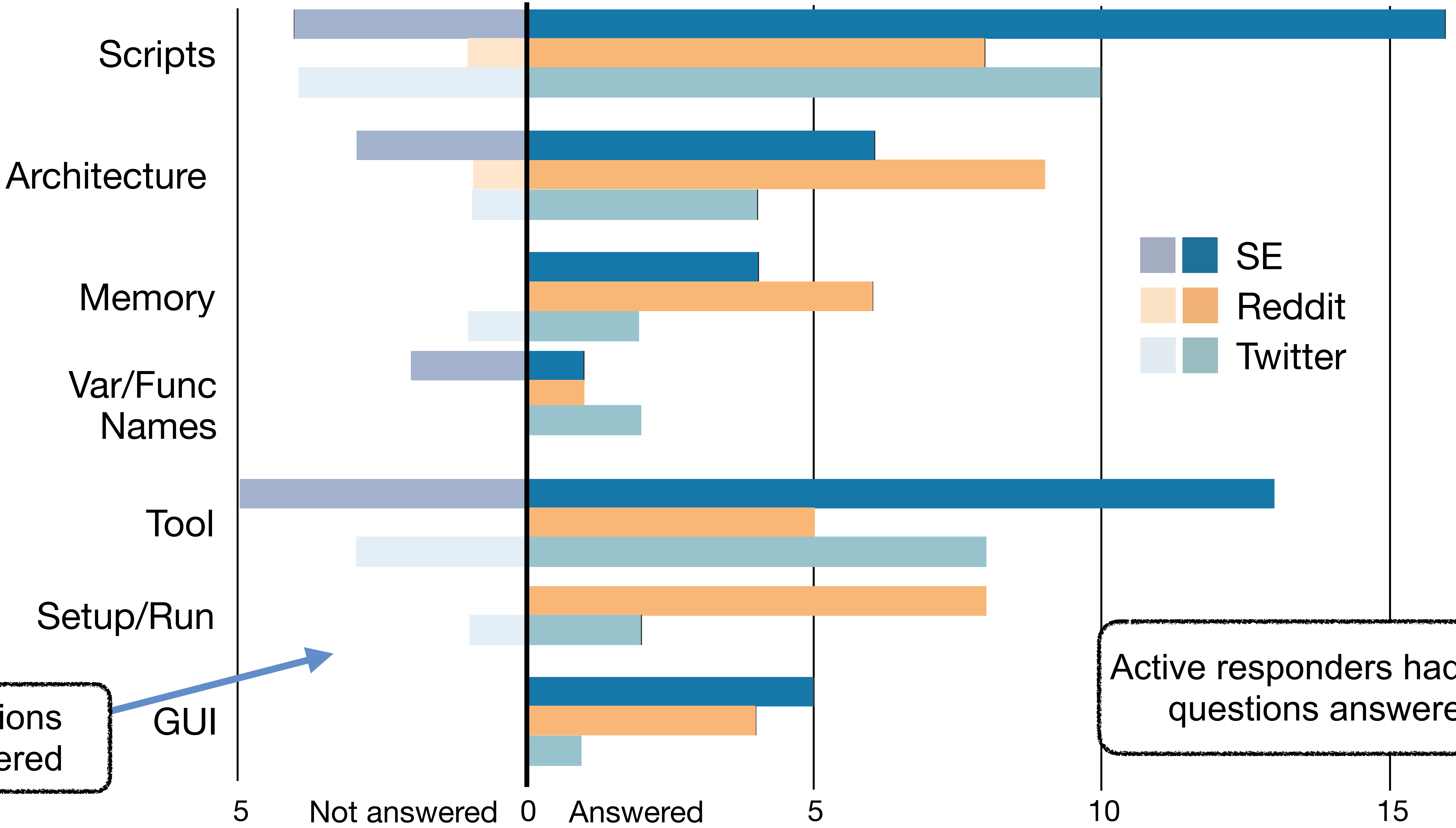


Most questions were answered

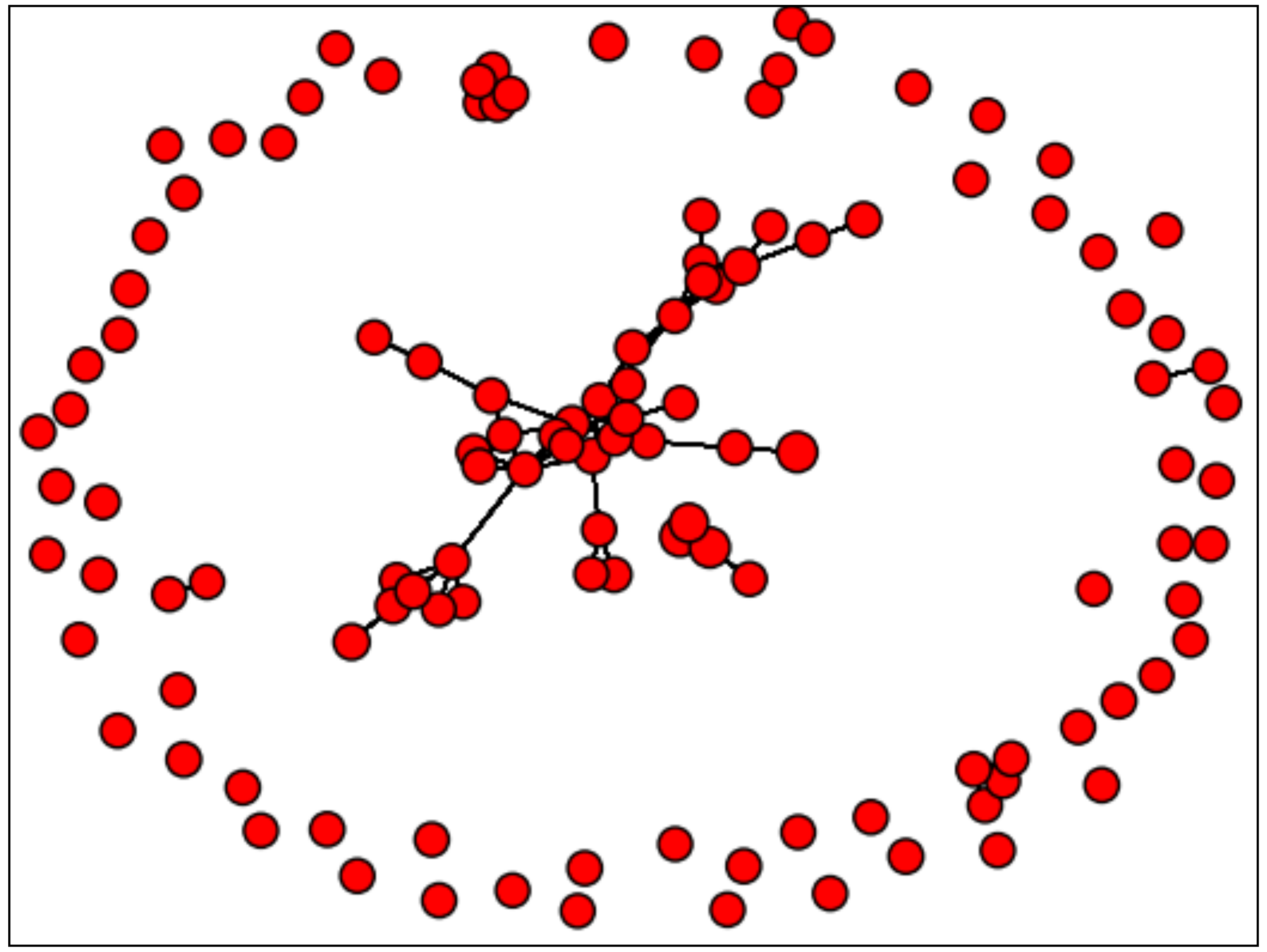
QUESTION ANSWERING



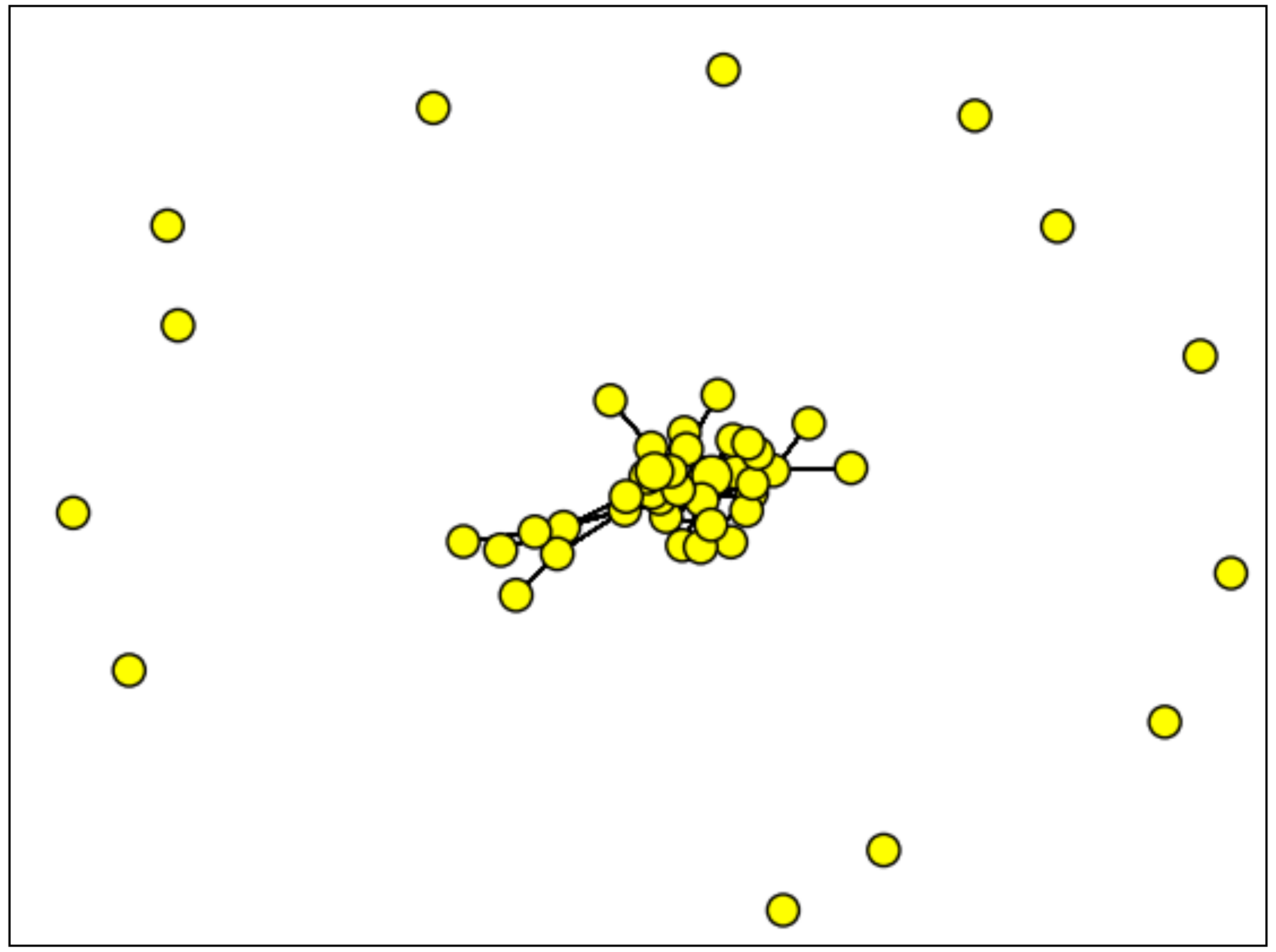
Most questions were answered

Active responders had their questions answered

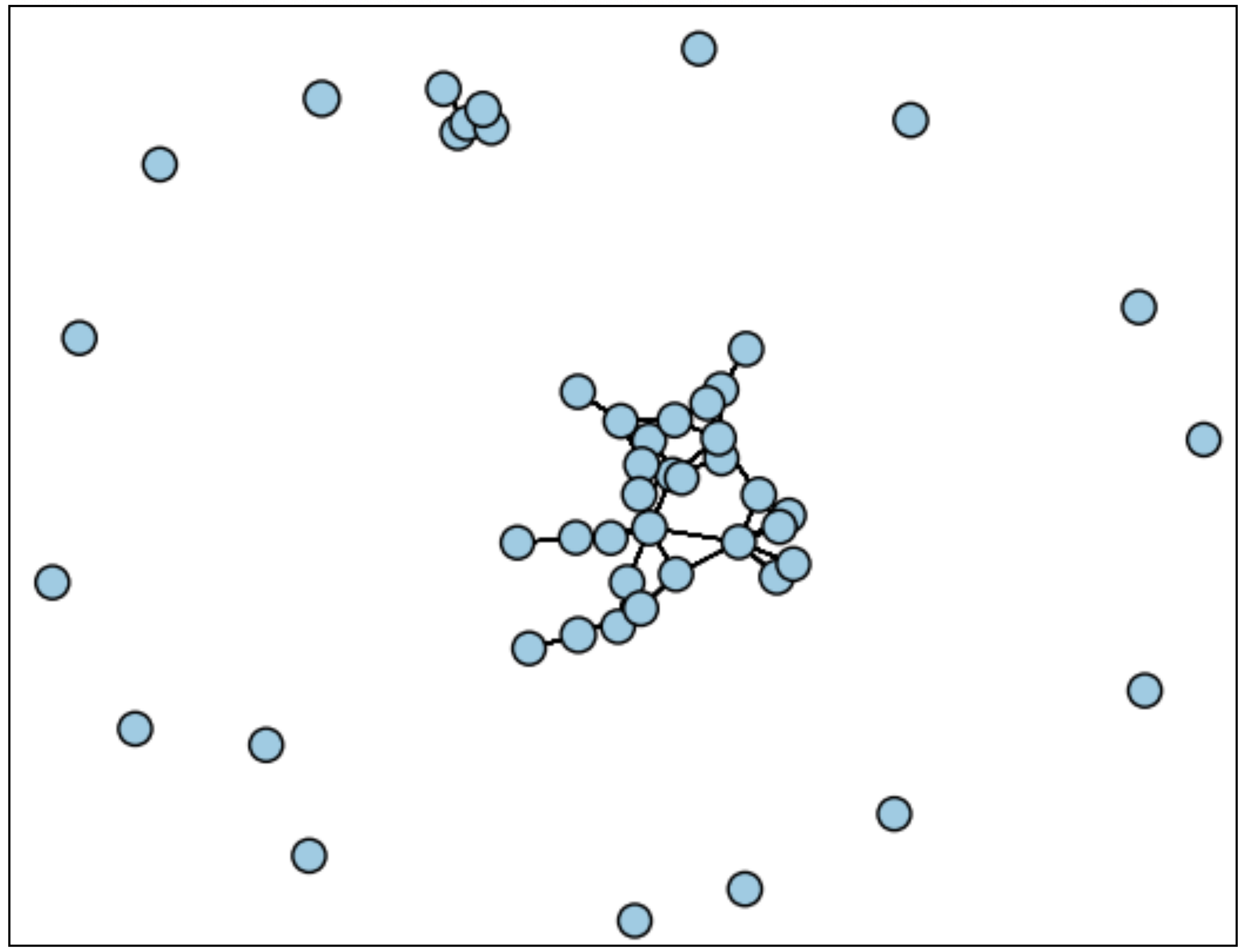
CLUSTERED USERS



Twitter



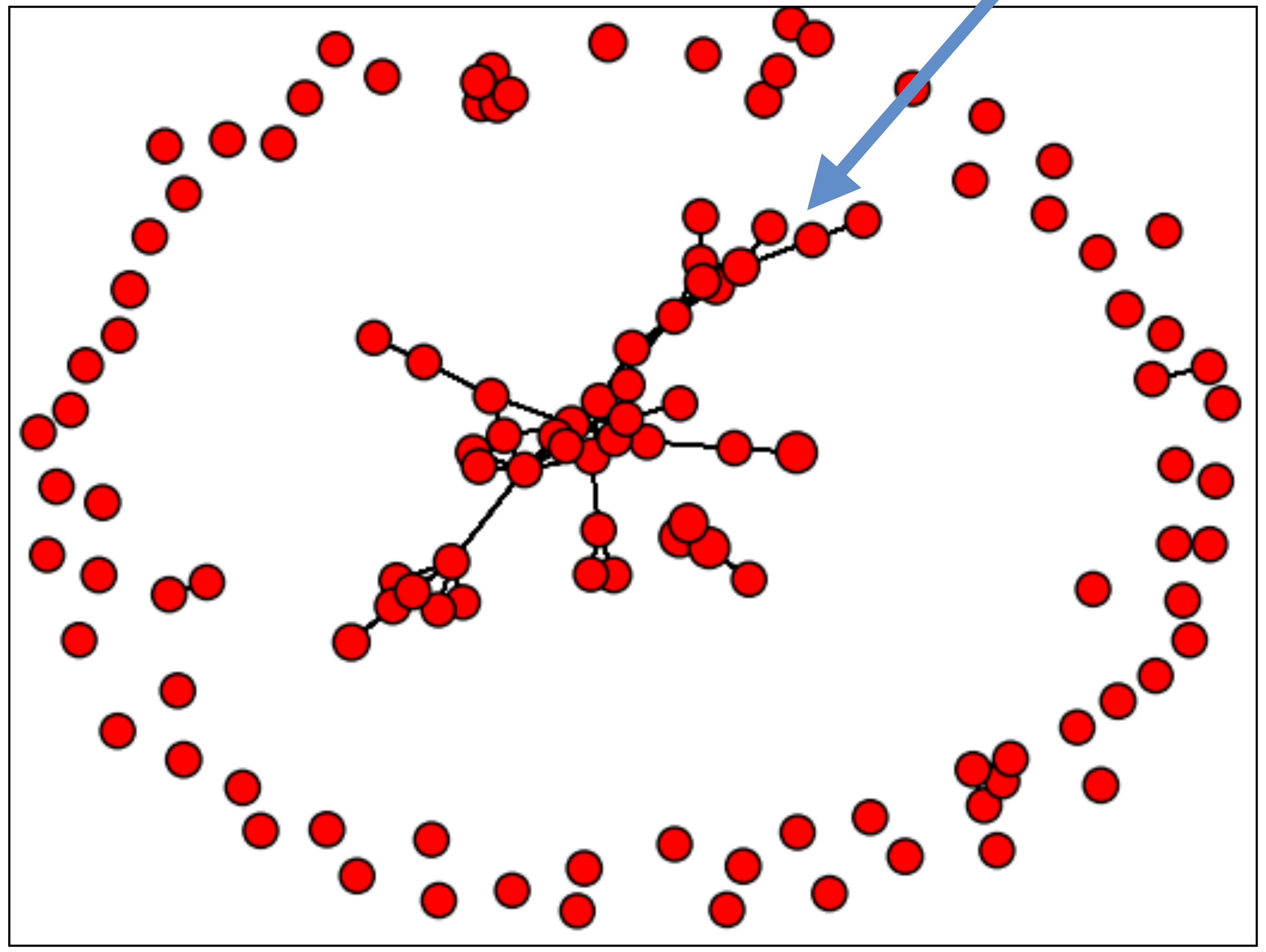
StackExchange



Reddit

CLUSTERED USERS

Central cluster and mostly isolated threads



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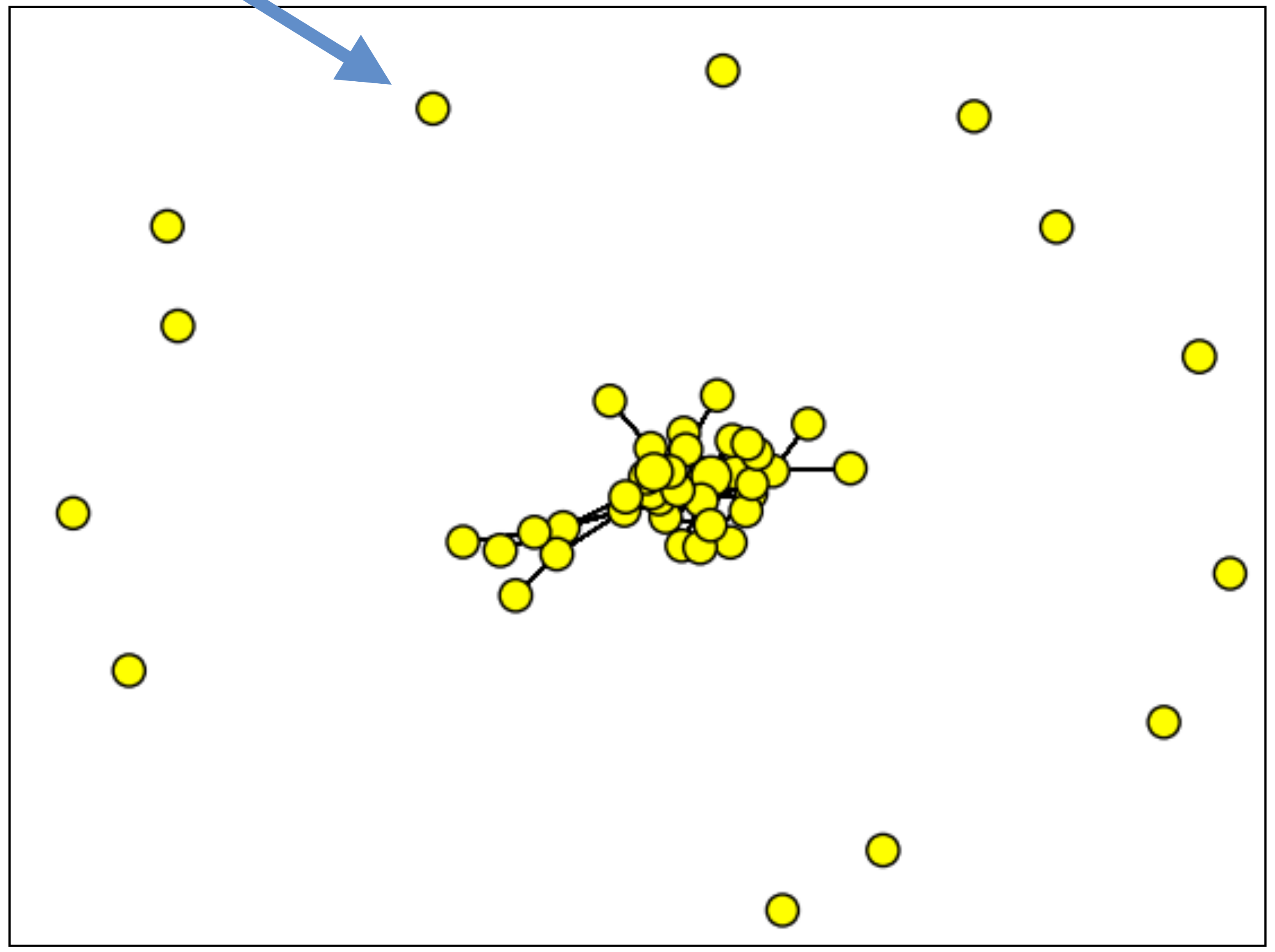

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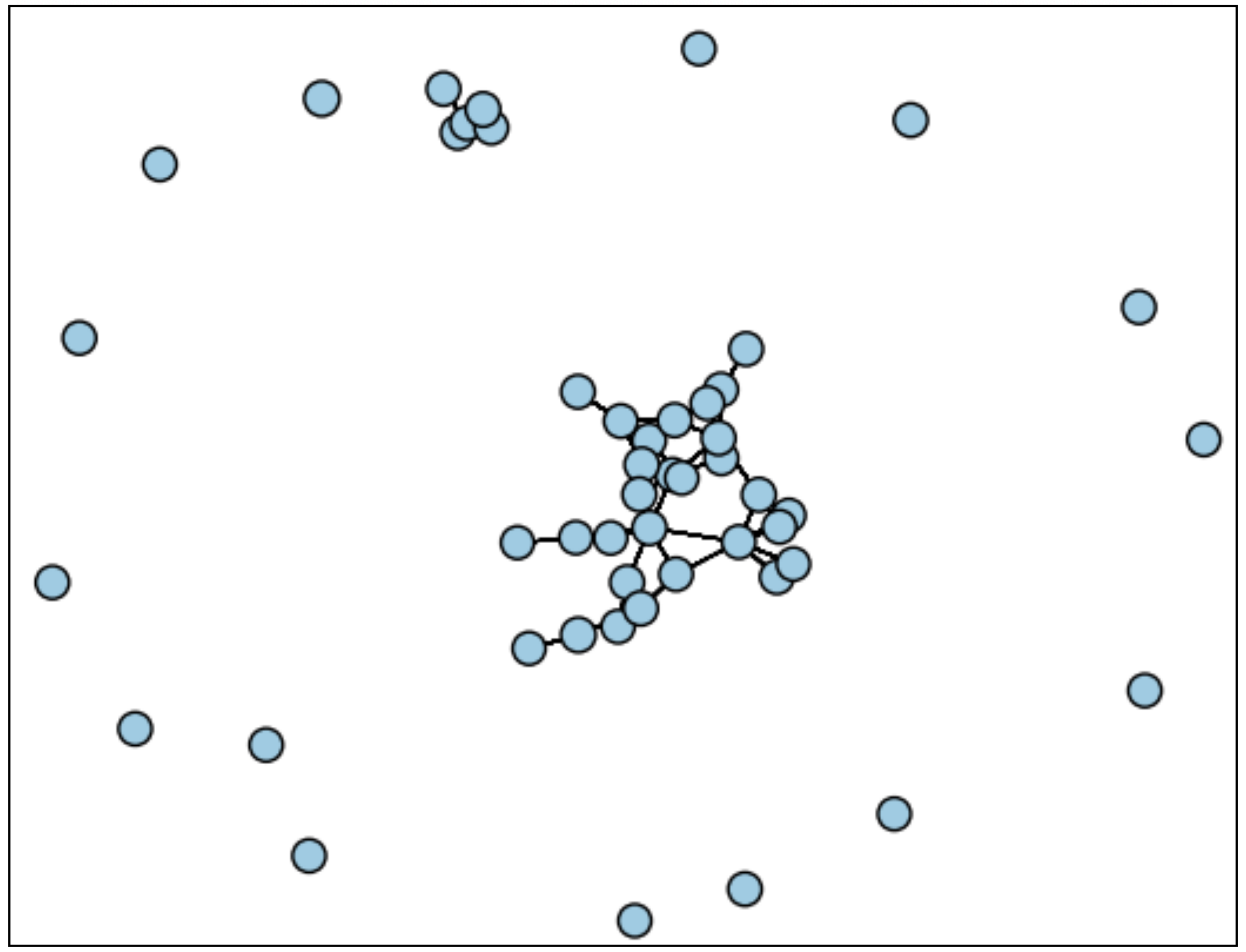

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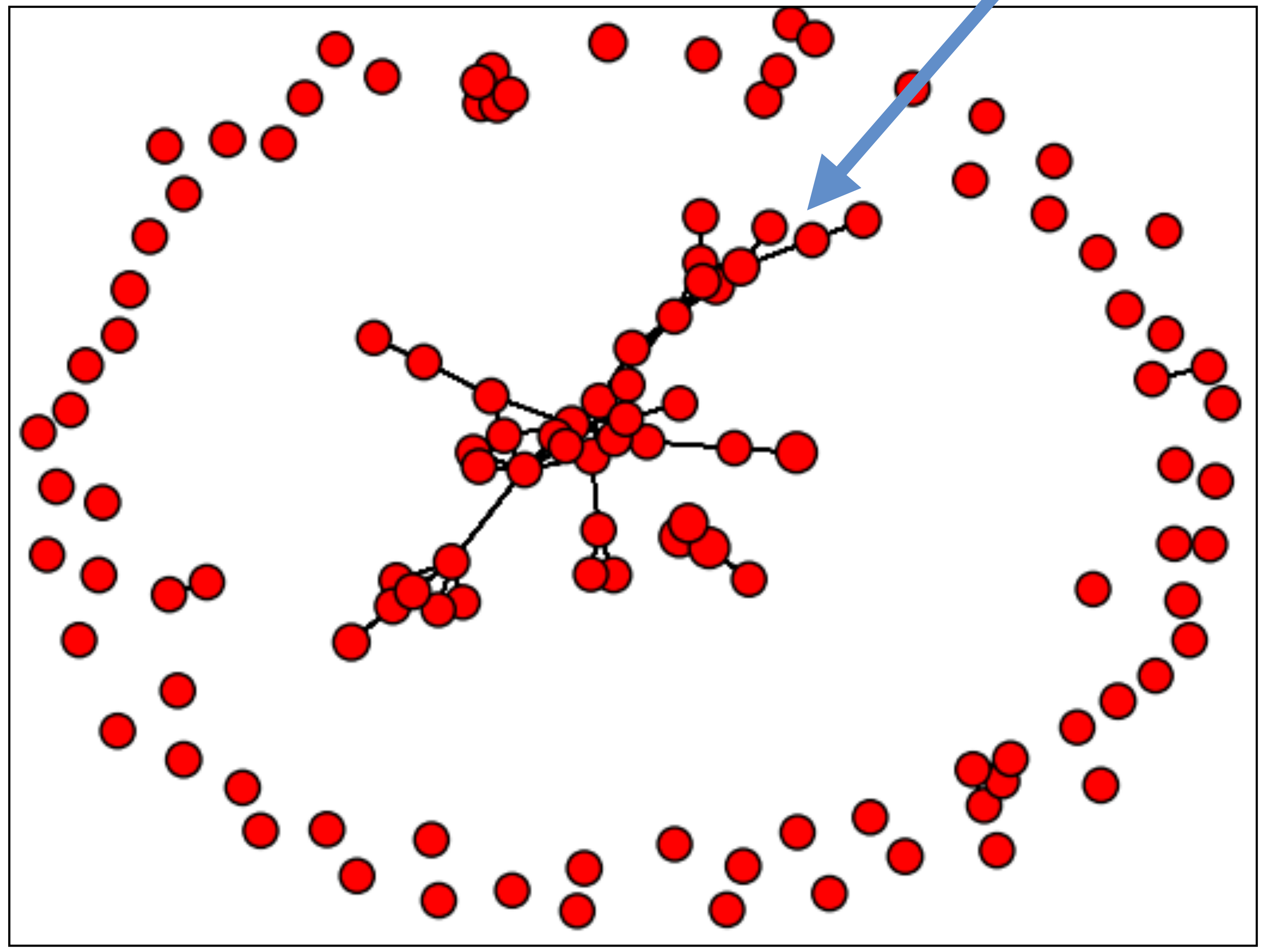

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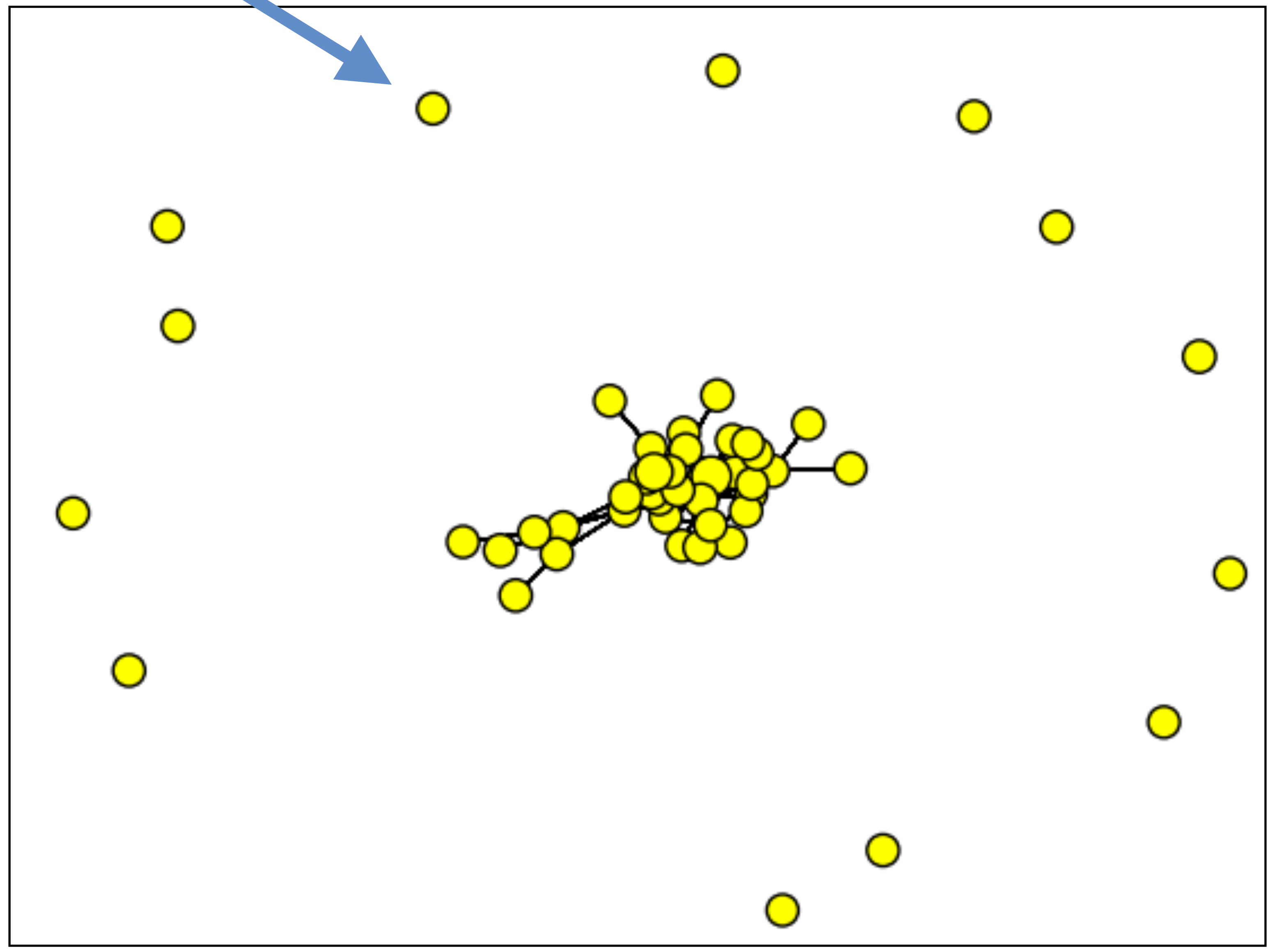

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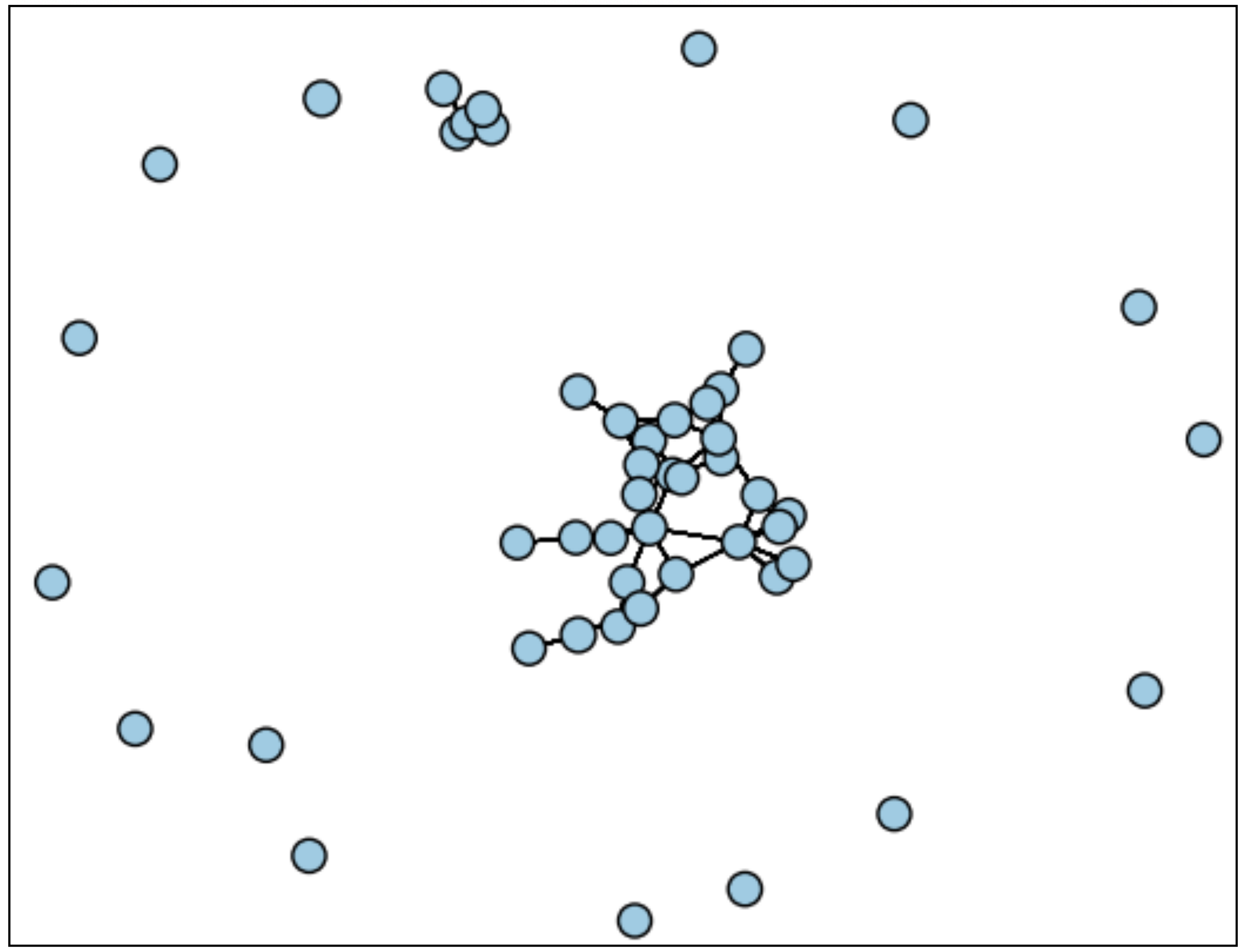

Reddit

Active responder threads included more sensemaking

RECOMMENDATIONS

Tool Developers

- Consider customization early
- Answer isolated user questions

RE Community

- Good information on all forums
- Incentivize answers for less active member

SUMMARY

Questions:
@drvotipka
dvotipka@cs.tufts.edu
sec-professionals.cs.umd.edu

Feature Discussions

- Customization is most common

Community Dynamics

- Most questions are answered
- Active responders more likely to have questions answered
- Central clusters of connected users; Others isolated

Recommendations

- Consider customization early
- Answer isolated user questions
- Consider all forums