



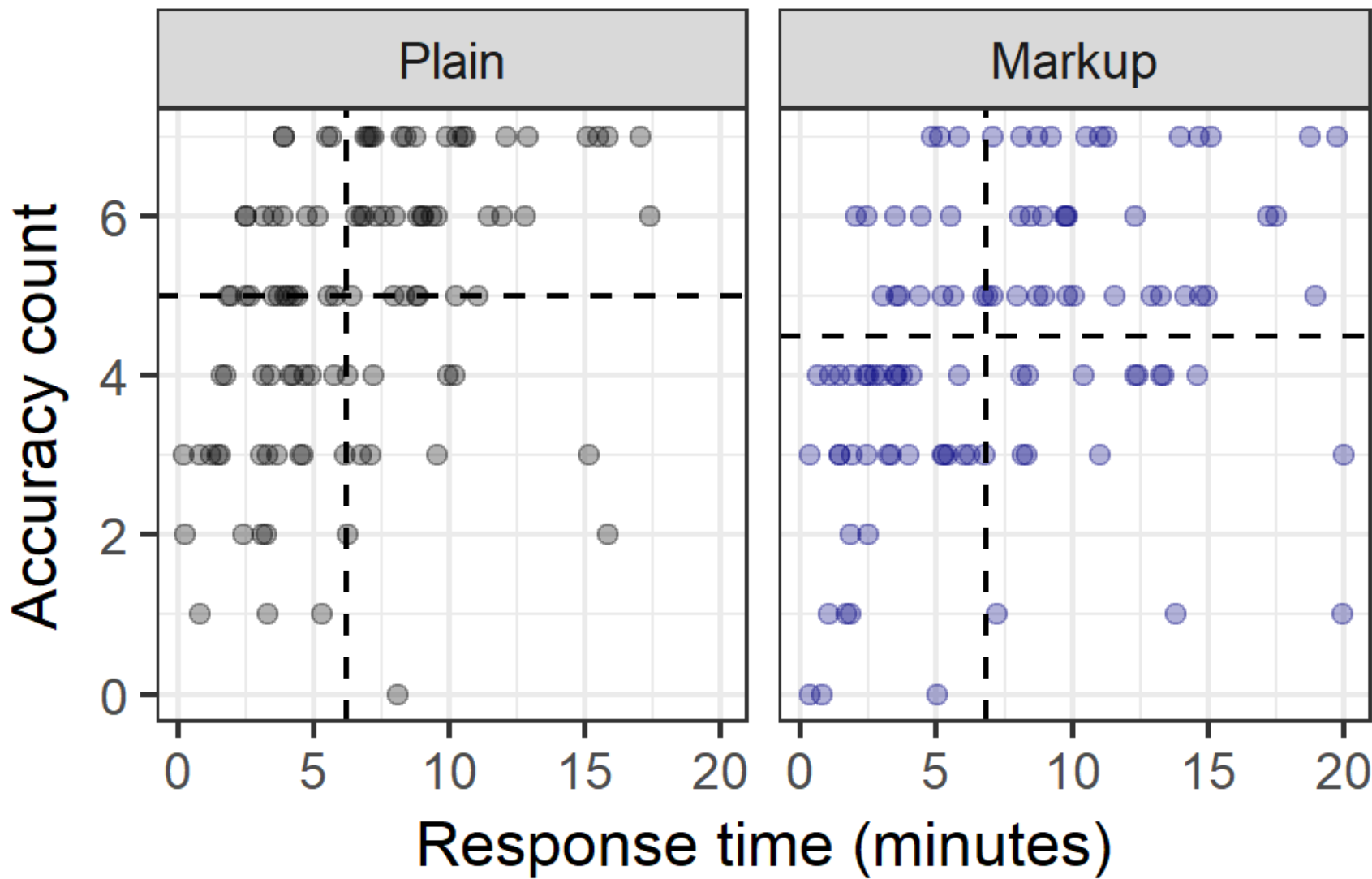
Evaluating Improvement in Situation Awareness and Decision-Making Through Automation

Background: Automated Information Extraction is designed to facilitate situation awareness by providing human decision makers with relevant information, but the real challenge is designing the output for optimal human understanding. This project compares the comprehension of text documents with / without automated markups and explores the existence of an optimal markup solution.

Experiment I (*automated markup*)

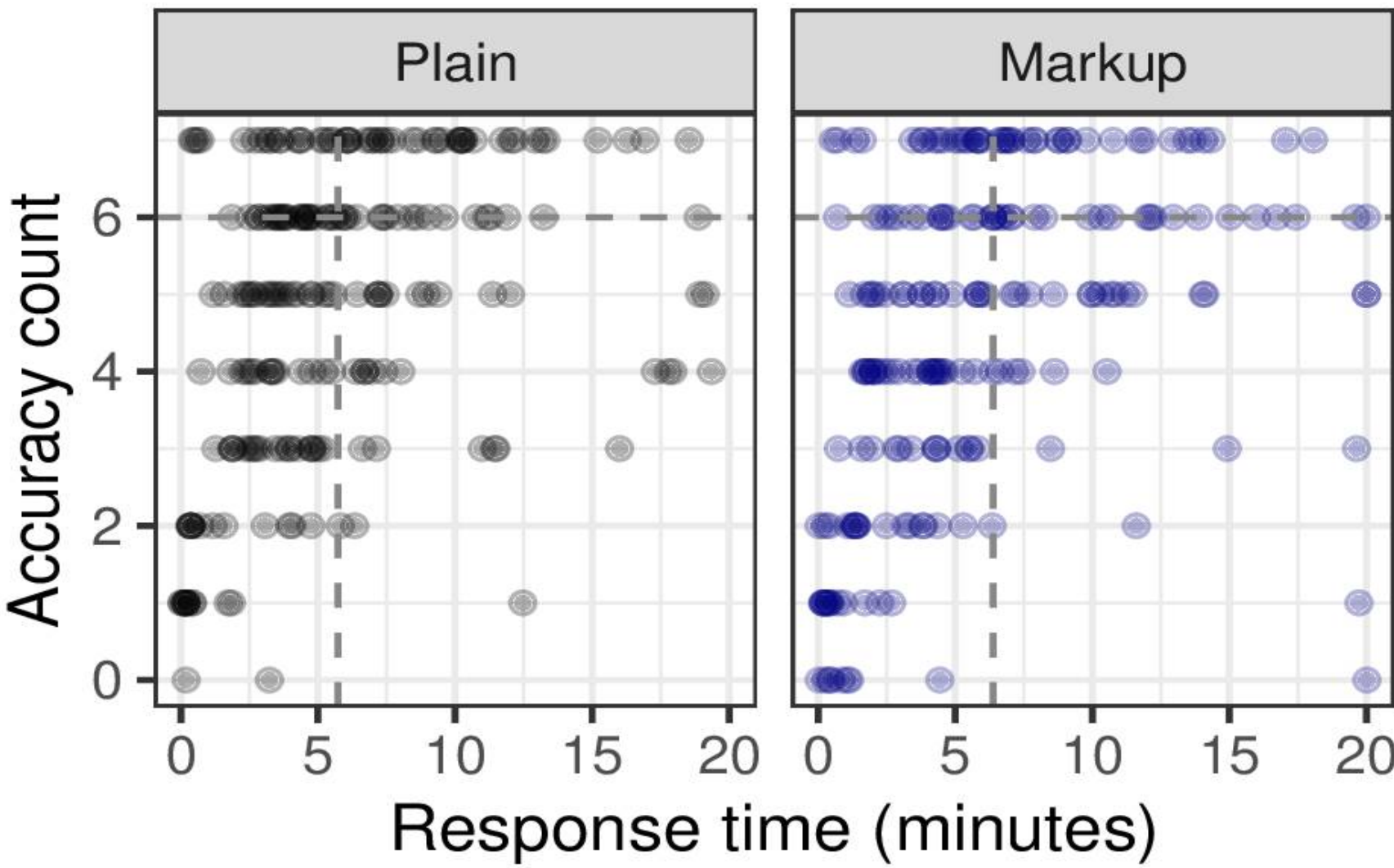
All the [ORG military] [FAC bases] in [CPE Perchland] are heavily protected. There is no new information about Raven. Perchland is land locked. [PER Locals] in [CPE Sharkland] are being - The [PER Turtle] <lost> [PER his] right eye. The Bronco [ORG group] does not <attack> [PER Members] of the [ORG Charger], [ORG Bronco] [ORG groups] have experience with. The shopping [FAC malls] in the [CPE coalition] [LOC area] are not well defended. Charger and Titan [ORG group] [PER members] have <entered> Perchland and [LOC Salmonland]. The [PER Panther], [PER Charger], [ORG Titan], and Raven [ORG groups] prefer to <attack> in daylight.

Event ID: EV32
Trigger: entered
Event Type: Movement
Event Subtype: Transport
Generichy: Specific
Modality: Asserted
Polarity: Positive
Tense: Past
Arguments:
Artifact members Destination Salmonland



Experiment II (*ideal markup*)

The Turquoise group focuses on destroying energy infrastructure. No attacks are being planned on religious organizations in Sigmaland. The target is in a coalition country (Muland, Xiland, Omicronland, Piland, or Sigmaland). An attack is being planned for the first month of the year. The Rose group may be involved. There is a lot of activity involving the Rose group. Embassies in Piland were recently attacked and evidence of more attacks has been found. There are reports that spent nuclear fuel is missing in Muland. The largest bank in Piland has 4 machine gun emplacements on its roof. No traces of members from the Blue group have been found in Sigmaland.



Discussion

- Automated markup led to worse performance on all measured factors. Adding “ideal” markup to plain text did not significantly improve / hinder performance. Is subjective preference reason enough to use?
- Strategies uncovered:
 - process of elimination
 - focus on ‘easier’ question
 - Popular strategies for plain text:
 - taking notes
 - Ctrl/Cmd+F
- Direction of results suggests that further changes that may lead to improved performance and SA:
 - Task-relevant wrt to mission value
 - Computational plausibility
 - Low-level features (e.g., color)
 - Density (how much markup is helpful)

Results

More accurate <u>without</u> markup	Accuracy	No Significant Change
Faster <u>without</u> markup	Response time	No Significant Change
Lower workload <u>without</u> markup	Workload	No Significant Change
Preferred <u>without</u> markup	Preference	Preferred <u>with</u> markup
NA	Trust in automation	No significant change in trust rating
NA	Strategies	See Discussion

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