MAiDE-up!

Multilingual Deception Detection of AI-generated Hotel Reviews

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Play a Game:

Real or AI generated hotel review?

Language	Real Review	Generated Review
Chinese	+ 早餐丰富，服务态度很好，房间很整洁，离地铁站很近。优秀 - 交通方便价格性价比不错; 设施有些陈旧可能因为疫情的缘故卫生各个地方显得很陈旧的污渍打扫看着不是那么上心早上在酒店大堂看见任何一个服务员均很冷漠没有打招呼的习惯希望能改进	+ 这家酒店的位置极佳，位于市中心，靠近主要的旅游景点。酒店的装修新颖，服务人员非常专业和友好。早餐也很美味，种类丰富。 - 该酒店地理位置优越，交通便利。我订的房间缺乏维护，房间内设施感觉比较陈旧，尤其是地毯，看上去非常脏旧，且有种异味。另外，酒店早餐品种不多，食品口味偏弱。最不满的是酒店的服务态度，服务员的服务意识强度不足，没有解决问题的积极性和主动性，完全不符合四星级酒店的标准。
English	+ *Nicely furnished room and nicely decorated lobby. Room service is affordable and the receptionists, especially Mr. Omar, are usually eager to help with any queries.* - *The location was very central and the staff was nice and helped us.; The room smelled like cigarettes and there was mold in the bathroom*	+ *The staff was extremely helpful and accommodating. Clean and well-furnished rooms. Central location with easy access to public transport.; The breakfast offerings could be more varied.* - *Nothing. Horrible experience.; Bad customer service, rooms were not clean and the food was below average.*
French	+ *Pas besoin de tourner pendant un moment pour trouver une place de Parking, un membre de l'hôtel se charge de prendre votre voiture; En soirée la rue n'est pas très familiale* - *Bon emplacement dans Ankara. Personnel très agréable.; Petit déjeuner moyen. Fuites dans la salle de bain. N'est pas du niveau d'un hôtel 5 étoiles.*	+ *L'hôtel est juste à côte de l'aéroport, parfait pour les vols tôt le matin. Les chambres étaient propres et confortables.; La diversité de la nourriture pourrait être améliorée.* - *L'emplacement est bien, situé à proximité du centre-ville d'Ankara; Le manque de propreté est notable. La nourriture n'est pas de bonne qualité et le service à la clientèle laisse à désirer. Les chambres sont bruyantes et mal isolées, et les meubles sont vieux et usés.*
German	+ *Die Lage ist super zentral! Zu Fuß nur 10 Minuten vom Kızılay Platz entfernt. Die Zimmer waren sehr sauber und sehr geschmackvoll eingerichtet. Das Frühstück war sehr reichhaltig und lecker. Das Personal ist sehr freundlich und hilfsbereit.; Keine* - *Das hotel ist einfach viel zu alt. Ehrlich gesagt ist es 3 sterne; Nicht sauber habe nicht im hotel duschen können. Wir hatten gesamt zwei zimmer beide schlecht sauber gemacht worden*	+ *Das Personal war sehr freundlich und das Zimmer war sehr sauber. Die Lage ist fantastisch, nahe an vielen Sehenswürdigkeiten. Das Frühstück hatte eine gute Auswahl an Speisen.* - *Die Lage des Hotels ist sehr zentral; Der Service war sehr schlecht und die Sauberkeit ließ zu wünschen übrig.*
Italian	+ *Struttura bella e pulita. Vicinissimo alla metro e centro città raggiungibile a piedi. Letto e cuscini comodissimi.; Il bagno turco aveva un odore strano.. muffa?* - *Staff disponibile e cordiale; La camera doveva essere doppia matrimoniale, ma il letto effettivamente è una piazza e mezzo, la moquet era macchiata.*	+ *Camera molto pulita e silenziosa, personale professionale e disponibile. La colazione era abbondante e deliziosa. Posizione eccellente nel centro della città.* - *La posizione è centralissima, vicino a molti negozi e ristoranti.; Stanze poco pulite e personale maleducato. Colazione molto scarsa e Wi-Fi praticamente inesistente.*
Korean	+ *직원들이 자기일처럼 성실히 도와주었으며 거실,방마다있는 에어컨도 방성능이 좋았으며,조명도 밝고 시설이 깨끗해서 편안했습니다; 세탁기는 있는데 드라이어나 건조대가 없어 옷 말리기가 불편했습니다* - *영등포역에서 가까워요. 침구가 깨끗합니다. 방은 깨끗; 전철이 있어서 시끄럽다는 후기가 있어 씨티뷰로 신청했지만 마찬가지로 소음이 심했습니다. 실내가 좁아 불편. 주차요금을 내야합니다. 화장실이 문이 없습니다*	+ *뉴 파크 호텔'은 매우 좋았습니다. 직원들이 친절하였고, 호텔 시설도 깨끗했습니다. 특히 아침식사가 훌륭했어요.; 방음이 잘 되지 않아 약간 소음이 있었습니다. 하지만 많이 거슬리지는 않았어요.* - *파리 중심부에 위치해 있어서 접근성이 좋았습니다.;객실이 너무 좁아서 실망했고, 침구가 깨끗하지 않았습니다. 또한, 냉난방 시스템이 제대로 동작하지 않아서 매우 불편했습니다.*
Romanian	+ *Gazde foarte amabile, primitoare, camera mare, curată, paturi confortabile, parcare proprie în fața hotelului, micul dejun, bufet, diversificat.* - *E ffff cald in camere! Și aparatele stricate, camerele mici!!*	+ *Servicii excelente, camere curate și spațioase. Spa-ul și piscina sunt minunate pentru relaxare."; Nu am avut nicio problemă sau dezamăgire.* - *Amplasarea hotelului este convenabilă, relativ aproape de majoritatea obiectivelor turistice.; Confortul camerei a fost sub orice critica, patul a fost foarte inconfortabil, iar curățenia a fost precară. De asemenea, personalul a fost nepoliticos si neajutorător.*
Russian	+ Шикарный завтрак, удобное расположение, доброжелательный персонал, согласовали ранний заезд; Немного грязное окно и тусклое освещение, но это мелочи - метро рядом , санлитунь рядом.; персонал за стойками регистрации, это просто треш, мало того, что цены в чеке не совпадали с ценой на букинге, так еще и чекаут оформляли 50 минут! это дно товарищи!	+ Отель с удобным расположением, близко к основным достопримечательностям. Очень чистые и комфортные номера. Отзывчивый и вежливый персонал.; Сложно было найти русскоговорящий персонал. Завтраки могли бы быть более разнообразными. - Нет положительных сторон.; Большая часть персонала не говорит по-английски, что особенно усложнило процесс общения. На завтраке был ограниченный выбор блюд, а в номерах отличался сильный запах курения.
Spanish	+ *Me gustó todo, super bonito, limpio, cómodo y en una zona muy animada, con un desayuno buffet genial; Nada* - *Hotel con bien trato, y muy céntrico, limpio y comodo; Discoteca justo debajo de la habitación muchísimo ruido y música disco mucho volumen hasta altas horas. No se puede descansar*	+ *Un hotel muy bueno. Estaba muy limpio y moderno. En el corazón de la ciudad, cerca de las tiendas y restaurantes. El personal fue amigable y la comida era buena.; La única queja que tenía era que el wifi en mi habitación era un poco lento.* - *Buena ubicación central y la habitación estaba limpia; El desayuno era muy básico y la presión del agua en la ducha era bastante baja*
Turkish	+ *Kahvaltısı çok güzeldi. Tam bir Fransız kahvaltısıydı. Personel çok güler yüzlüydü. Otel çok merkezi bir konumdaydı. Tekrar Paris'e gelirsem tercihim yine buradan yana olur.* - *Bookingde sigarasız yazmasına rağmen ortak havalandırmadan sigara dumanı geliyordu wi-fi çalışmıyordu*	+ *Otelin konumu ve erişilebilirliği mükemmel. Odalar temiz, konforlu ve fonksiyonel.; Oda sıcaklık ayarları biraz daha iyi olabilirdi.* - *Otelin konumu iyi.; Oda temizliği yetersizdi, yemekler çok tuzluydu ve personel pek yardımcı olmadı. Bu nedenlerden dolayı diğer turistlere bu oteli önermiyorum.*

Table 1. Random reviews with pos (+) and neg (-) sentiments across 10 languages.

Paper Contributions

- **20,000 Hotel Reviews** – 10,000 real & 10,000 fake.
- **10 Languages** – *English, Chinese, French, German, Italian, Korean, Romanian, Russian, Spanish, Turkish.*
- **Diverse Locations & Sentiments** – Reviews span 10 locations with varying sentiment polarities.
- **AI vs. Human Language Markers** – Syntactic & lexical differences in LLM-generated vs. real hotel reviews.
- **Deception Detection Insights –** Key factors affecting multilingual fake review detection performance.

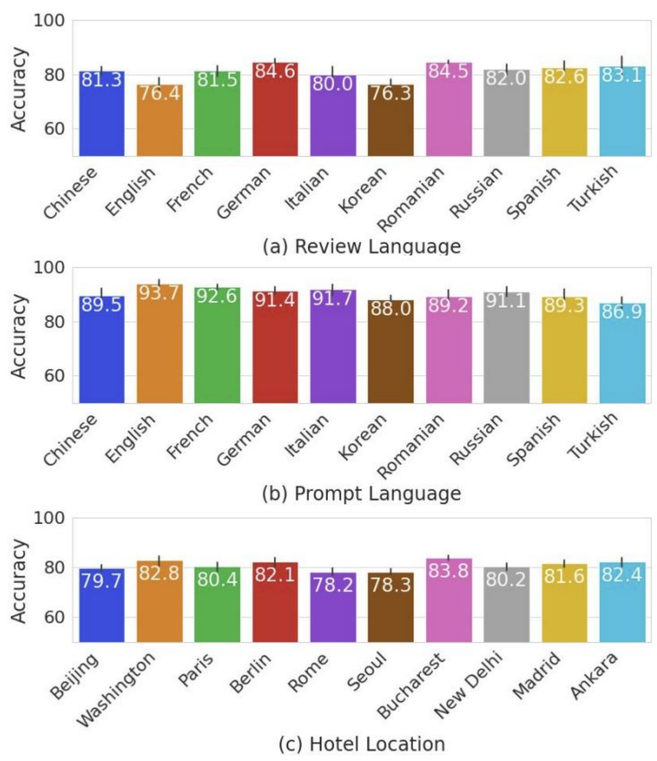

Fig 1. Accuracy with XLM-RoBERTa model per (a) review language, (b) prompt language, (c) hotel location on the few-shot train-test split

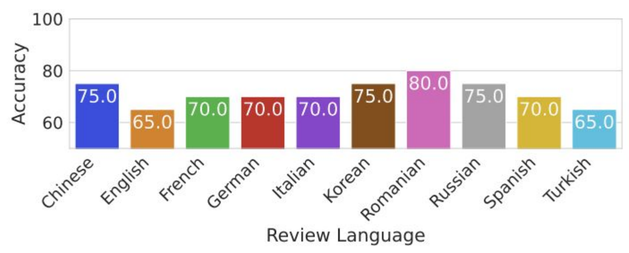

Fig 2. Human accuracy per review language.

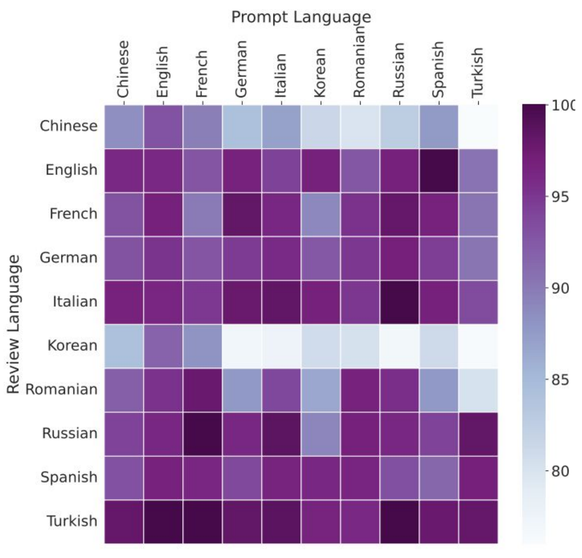

Fig 3. Acc with XLM-RoBERTa model per prompt and review language on few-shot train-test split.

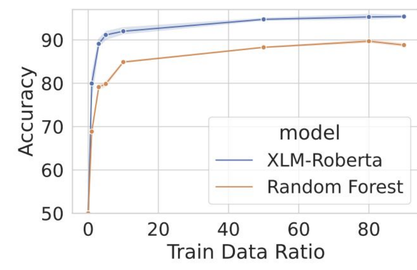

Fig 4. Accuracy measured with XLM-RoBERTa and best Random Forest model on different ratios of training data. **The accuracy plateaus at 10%, i.e., 2,000 reviews**.

	default		*few-shot*	
	real	gen	real	gen
Train	8,000	8,000	100	100
Test	2,000	2,000	9,900	9,900

Table 2. Experimental train-test data split: default split 80-20%, while the few-shot 1-99%.

Features	**Setup**	**Accuracy**	**F1**
Interpretable Baselines: NAIVE BAYES / RANDOM FOREST			
Analytic scores	*default*	53.3 / 53.9	63.2 / 64.3
	few-shot	52.1 / 51.1	63.6 / 32.1
Descriptive scores	*default*	58.3 / 61.0	63.1 / 58.6
	few-shot	58.4 / 57.4	57.7 / 57.5
Readability scores	*default*	53.5 / 57.3	61.6 / 58.7
	few-shot	53.6 / 53.0	61.8 / 57.7
Token counts	*default*	79.6 / 87.4	82.2 / 88.0
	few-shot	54.4 / 62.9	54.9 / 66.6
TF-IDF scores	*default*	84.5 / 87.7	83.9 / 86.9
	few-shot	64.6 / 67.1	69.6 / 57.1
All scores	*default*	84.3 / **89.3**	84.1 / **89.2**
	few-shot	66.3 / 70.6	70.5 / 66.8
Main Model: XLM-ROBERTA			
-	*default*	**94.8**	**94.9**
-	*few-shot*	76.6	80.1
Human	-	71.5	69.1

Table 3. Classification test results with the few-shot and default setups over all languages.

Code and Dataset: