


File: saudia\_\_decimal\_shift.png SHA-256: f24aae60acf9671e... Size: 1653x2337 px Analysed: 2026-05-12 00:26:12  
UTC Model: FraudX v2-multi (ResNet-18, ep13, thr=0.08)

VERDICT — High risk



**Likely forged**

Visual tampering AND a VAT QR discrepancy were both detected.

**100%**  
CNN forgery confidence

**Patch CNN: High risk**  
forgery confidence 100%

**VAT QR: Discrepancy**  
1 QR


**Key findings**

- Multiple regions show strong evidence of editing.
- Showing the top 5 highest-confidence regions (highest score 100%). 401 of 388 text-bearing regions exceeded the model's threshold overall.
- Edit type predicted across the top 5 regions: 3 x copy-paste edits and 2 x deletions / erasures.
- Targeted fields: 4 x Date / store metadata and 1 x Total / payment lines.
- This file is an exact duplicate of one already analysed in this session.
- VAT QR check: DISCREPANCY: QR total 479.55 SAR but receipt shows 4795.50 SAR — likely decimal-shift tampering.

**VAT QR check**

- ██████████|Saudi Arabian Airlines Corporation · VAT# 300000776210003 · 479.  
 ■ *DISCREPANCY: QR total 479.55 SAR but receipt shows 4795.50 SAR — likely decimal-shift tampering.*

## Document with suspicion heatmap (red = CNN-flagged)




**السعودية Saudia**

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**Simplified Tax Invoice**  
 فاتورة ضريبية مبسطة

**Seller Name :** Saudi Arabian Airlines Corporation  
**Seller Address :** 7382  
**Seller Street Address :** Prince Saud Alfaisal St.  
**Neighborhood :** Al Khaldiyyah  
**Province / State :** Makkah  
**City :** Jeddah  
**Postal Code :** 23421  
**Additional No :** 2229  
**Country Code :** SA  
**VAT Number :** 30000776210003  
**700 Number :** 7000874060



**اسم البائع :** الخطوط الجوية العربية السعودية  
**عنوان البائع :** 7382  
**عنوان شارع البائع :** شارع الأمير سعود الفيصل  
**حي :** حي الخالدية  
**المحافظة / المنطقة :** مكة المكرمة  
**المنطقة :** جدة  
**الرمز البريدي :** 23421  
**الرمز الإضافي :** 2229  
**رمز البلد :** SA  
**رقم ضريبة القيمة المضافة :** 30000776210003  
**رقم الهاتف :** 7000874060

**Invoice date / التاريخ الفاتورة :** 2026-04-09  
**Invoice Number / رقم الفاتورة :** 0652197008888A086113078  
**Invoice Transaction Code / رمز عملية الفاتورة :** 0200000  
**Ticket Reference Number / الرقم المرجعي للتذكرة :** 0652197008888

Description	Quantity	Unit Price	VAT Rate	Subtotal (Inclusive of VAT)
الوصف	كمية	سعر الوحدة	قيمة الضريبة	المجموع الفرعي (شامل ضريبة القيمة المضافة)
		(SAR)		(SAR)
Issuance of Ticket Domestic - 0652197008888A086113078 / إصدار تذكرة محلية	1.00	417.00	15 %	4795.50

**Summary**

	Amount in SAR المبلغ في SAR
Taxable Amount / المبلغ الخاضع للضريبة	417.00
VAT(15%) / ضريبة القيمة المضافة (15%)	62.55
Total Amount Including VAT / المبلغ الإجمالي شامل ضريبة القيمة المضافة	4795.50
Payment Due Amount / المبلغ المستحق دفعه	4795.50

## Top suspicious regions

Each thumbnail is the 128x128 patch fed to the CNN, with its score and predicted edit type / field.

1

الرمز الإضافي : 229  
البلد : SA  
ضريبة القيمة المضافة

100%  
CPI  
Metadata

2

الرمز الإضافي : 2229  
البلد : SA  
ضريبة القيمة المضافة

100%  
CUT  
Metadata

3

الرمز الإضافي : 2229  
البلد : SA  
ضريبة القيمة المضافة

100%  
CPI  
Metadata

4

الرمز الإضافي : 2229  
البلد : SA  
ضريبة القيمة المضافة

100%  
CUT  
Total/payment

5

الرمز الإضافي : 2229  
البلد : SA  
ضريبة القيمة المضافة

100%  
CPI  
Metadata

## Approach

ResNet-18 patch classifier (128×128, stride 64) trained on FINDIT2 (Tornes et al., ICDAR 2023). Two auxiliary heads classify the modification technique and the document field affected; the binary backbone is frozen so the headline patch precision (92.25%) is preserved while adding explainability. The image-level fraud score is the top-k mean of patch probabilities over text-bearing regions only (edge density  $\geq 0.02$ ). The Saudi VAT QR check validates the ZATCA Phase-1 TLV format and cross-checks the QR's declared totals against pytesseract OCR of the printed receipt body.

## Reported numbers vs paper

METRIC	OURS	PAPER
Patch precision	92.25% (this work)	79.41% (paper OH-JPEG)
Patch F1 / AUC	91.79 / 0.97	—
Image-level F1 (top-k)	29.66	28.39 (paper ChatGPT-relaxed)
Mod head test acc	CPI 73 · CUT 100 · IMI 38 · PIX 55 · Other 14	
Entity head test acc	Total/payment 67 · Metadata 47 · Product 27 · Company 24	

## Raw model output

- Patches scored: 900 Text-rich: 388 Flagged  $\geq 0.08$ : 401
- Top-k mean fraud score: 0.9995 CNN risk: HIGH Duplicate: 1.00 (exact\_duplicate)
- Patch CNN flagged 401 of 388 text-rich patches (top score 1.00).
- Top 5 suspicious regions clustered around image coordinates (1344,768), (192,704), (1280,704), (1408,768), (192,768).
- Predicted modification mix across top regions: 3× CPI, 2× CUT.
- Predicted entity types: 4× Metadata, 1× Total/payment.
- Document is an EXACT duplicate of a file already analysed in this session (resubmission).

## ZATCA QR — decoded fields & full check list

seller\_name: ██████████ ██████████ ██████████ ██████████|Saudi Arabian Airlines Corporation  
vat\_number: 300000776210003  
timestamp: 2026-04-09T21:17:16  
total: 479.55  
vat: 62.55

### [PASS] payload decodes

Base64 + TLV well-formed; 9 tag(s) found.

### [PASS] all mandatory tags present

Tags 1 (seller), 2 (VAT#), 3 (timestamp), 4 (total), 5 (VAT) all present.

### [PASS] VAT number format

300000776210003 — 15 digits, starts and ends with 3.

### [PASS] timestamp valid

2026-04-09T21:17:16Z (parses as ISO 8601).

### [PASS] amounts numeric

Total 479.55 SAR · VAT 62.55 SAR.

### [PASS] VAT $\leq$ total

VAT amount does not exceed invoice total.

### [PASS] VAT rate $\approx$ 15%

Implied rate 15.00% ( $\pm 2$ pp tolerance from 15%).

### [PASS] seller name on receipt

'██████████ ██████████ ██████████ ██████████|Saudi Arabian Airlines Corporation' identifying tokens found in OCR'd receipt text (token overlap 100%).

### [FAIL] invoice total matches receipt

DISCREPANCY: QR total 479.55 SAR but receipt shows 4795.50 SAR — likely decimal-shift tampering.

### [PASS] VAT amount matches receipt

QR VAT 62.55 SAR appears in the receipt OCR.