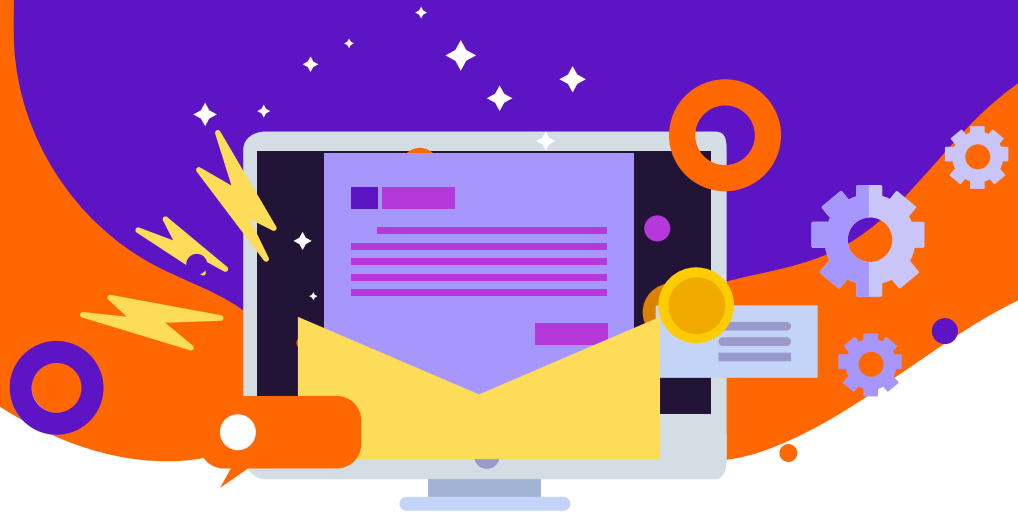


Email Redactor AI

Reflex application presentation

Introduction

Email Privacy Redactor AI is a sophisticated web application that automatically detects and redacts sensitive information from both email text and attached images before sending. Built with modern AI technologies, it ensures your emails remain compliant with privacy regulations (GDPR, HIPAA, etc.) while maintaining readability.

Problem

Sharing emails often requires redacting sensitive information like

- Personal identifiable information (PII)
- Financial data (credit cards, account numbers)
- Authentication credentials (passwords, tokens, API keys)
- Healthcare information
- Confidential business data

Manually finding and redacting this information is

❌ Time-consuming and error-prone

❌ Easy to miss hidden sensitive data

❌ Impractical for images and screenshots

❌ Risk of human error leading to data breaches

Our Solution

01

AI-Powered Detection

Uses advanced LLM models to intelligently identify 12+ types of sensitive information

02

Text Redaction

Automatically replaces sensitive data in email content with customizable placeholders

03

Image Redaction

OCR + AI analysis to redact sensitive text from images and screenshots

04

Granular Control

Enable/disable specific redaction types based on your needs

05

Direct Integration

Preview, edit, and send redacted emails seamlessly

06

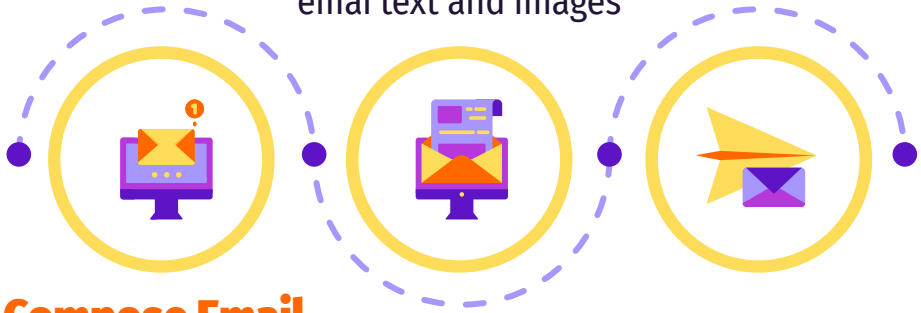
Privacy-First

All processing happens securely with no data storage

Workflow

Preview Email

User varifies that personal data was redacted by AI from emai text and images

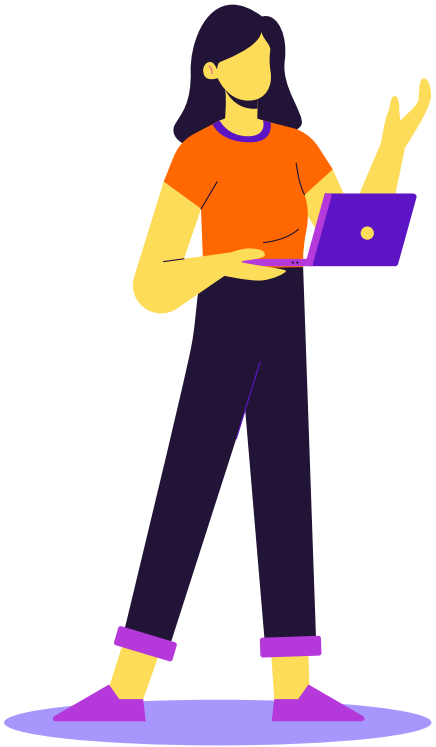


Compose Email

User enters email text, attaches images and hits Send Email button

Send Email

Verified redacted email is sent to the recipients



Compose Email – How It Works

1. Fill Email Details

- Enter recipient(s) in "To" field
- Optionally add CC recipients
- Enter email subject
- Type or paste email content in the Content area

2. Optional: Load Test Content

- Click the 📄 icon next to "Content:" label
- Select from predefined test files
- Content automatically populates the text area

3. Optional: Upload Images

- Click "Upload Images" button or drag-and-drop
- Or click the 🖼️ icon to load sample test images
- Upload up to 4 images (max 5 MB total)
- Images appear as thumbnails; click to view full-size

4. Configure Redaction Settings

- Each redaction type has a checkbox (enabled by default) and customizable placeholder
- Check/uncheck types you want to redact or skip
- Edit placeholder text (e.g., change [NAME] to [REDACTED NAME])
- Click "Preview Redacted Email“ button

Compose Email Features

Email Redactor AI

Compose your email and add images if needed. For a quick test use icon menus below: - to populate sample content, - to load sample images. Click Preview to automatically redact sensitive information.

To:
john@yahoo.com,

Real-time validation for To and CC fields

CC: (optional)
martha

Invalid email address(es): martha

Subject:
Redacted email sample

Quick-load sample emails from predefined test files

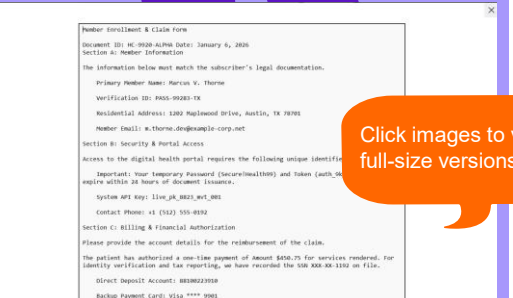
Content:
Member E
Document
Section A:
Incident Report
Member Enrollment
Service Activation Record
6, 2026
The information below must match the subscriber's legal documentation.
Primary Member Name: Marcus V. Thorne
stin, TX 78701
Section B: Security & Portal Acc
Access to the digital health portal r
Important: Your temporary Passw

Quick-load sample images from predefined test files

Incident Report
Member Enrollment
Service Activation Record
Upload Selected

✨ Attach images: Sensitive text detected and redacted automatically

Upload Images


Member Enrollment & Claim Form
Document ID: HC-9920-ALPHA Date: January 6, 2026
Section A: Member Information
The information below must match the subscriber's legal documentation.
Primary Member Name: Marcus V. Thorne
Verification ID: PASS-99203-TX
Residential Address: 1202 Maplewood Drive, Austin, TX 78701
Member Email: m.thorne.dev@example-corp.net
Section B: Security & Portal Access
Access to the digital health portal requires the following unique identifi
Important: Your temporary Password (SecureWealth99) and Token (auth_9
expire within 24 hours of document issuance.
System API Key: live_pk_8823_mvt_001
Contact Phone: +1 (512) 555-0192
Section C: Billing & Financial Authorization
Please provide the account details for the reimbursement of the claim.
The patient has authorized a one-time payment of Amount $450.75 for services rendered. For identity verification and tax reporting, we have recorded the SSN XXX-XX-1192 on file.
Direct Deposit Account: 883002223918
Backup Payment Card: Visa **** 9901

Click images to view full-size versions

Multiple images support (max 4 images, 5 MB total)

Please, fix input errors above

× Clear

Preview Redacted Email

Redact this information:

- [x] Name: [NAME]
- [x] Email: [EMAIL]
- [x] Phone: [PHONE]
- [x] Address: [ADDRESS]
- [x] SSN: [SSN]
- [x] Card: [CC CARD]
- [x] API Key: [KEY]
- [x] Passwd: [PASS]
- [x] Token: [TOKEN]
- [x] ID: [ID]
- [x] Amount: [$]
- [x] Account: [ACCOUNT]

Custom Placeholders: edit replacement text for each redaction type

Enable/Disable Controls: checkbox-based control for each redaction type

- ✅ Names (First names, last names, full names)
- ✅ Email Addresses (Any email format)
- ✅ Phone Numbers (All international formats)
- ✅ Physical Addresses (Street, city, state, zip)
- ✅ Social Security Numbers (SSN formats)
- ✅ Credit Card Numbers (Including masked formats like Visa **** 9901)
- ✅ API Keys (Various key formats)
- ✅ Passwords (Password values, not labels)
- ✅ Tokens (JWT, API tokens, session tokens)
- ✅ ID Numbers (Document IDs, verification IDs like HC-9920-ALPHA)
- ✅ Dollar Amounts (Prices, salaries, costs)
- ✅ Account Numbers (Bank accounts, customer accounts)

Compose Email – How It Works (Redaction)

1. Text Redaction

- Email content sent to Groq API
- AI analyzes text and identifies sensitive information
- Replaces with specified placeholders
- Returns redacted text

2. Optional: Image Redaction

- Each image sent to OCR.space API
- OCR extracts text with coordinates
- Text boxes sent to Groq AI for classification
- PIL draws black boxes over sensitive text areas
- Returns redacted images

3. Real-time Feedback

- AI feedback panel shows progress
- Connecting to Groq API
- Sending text to Groq API
- Text redaction complete (X tokens used)
- Processing x image(s)
- All images processed successfully

Compose Email Features

Email Redactor AI

Compose your email and add images if needed. For a quick test use icon menus below: - to populate sample content, - to load sample images. Click Preview to automatically redact sensitive information.

To:

john@yahoo.com

CC: (optional)

martha@gmail.com

Subject:

Redacted email sample

Content:

Member Enrollment & Claim Form

Document ID: HC-9920-ALPHA Date: January 6, 2026
Section A: Member Information

The information below must match the subscriber's legal documentation.

Primary Member Name: Marcus V. Thorne

Verification ID: PASS-99283-TX

Residential Address: 1202 Maplewood Drive, Austin, TX 78701

Member Email: m.thorne.dev@example-corp.net

Section B: Security & Portal Access

Access to the digital health portal requires the following unique identifiers.

Important: Your temporary Password (SecureHealth99) and Token

Redact this information:

- [x] Name: [NAME]
- [x] Email: [EMAIL]
- [x] Phone: [PHONE]
- [x] Address: [ADDRESS]
- [x] SSN: [SSN]
- [x] Card: [CC CARD]
- [x] API Key: [KEY]
- [x] Passwd: [PASS]
- [x] Token: [TOKEN]
- [x] ID: [ID]
- [x] Amount: [$]
- [x] Account: [ACCOUNT]

AI Feedback:

```
[20:11:32] Connecting to Groq API for text redaction...
[20:11:32] Sending text to Groq API (Llama 3.3 70B)...
[20:11:33] Groq API: Text redaction complete (997 tokens used)
[20:11:33] Processing 4 image(s) with OCR.space...
[20:11:33] Processing image 1/4...
```

Real-time AI Feedback: Live status updates during redaction process

Attach images: Sensitive text detected and redacted automatically

Upload Images

Clear

Redacting with AI...

Progress Indicator: Button changes caption to Redacting with AI and shows progress indicator

Preview Email – How It Works

1. Overview

- Page displays redacted email content (editable)
- Check that non-sensitive information remains intact
- "Show Comparison" button for side-by-side text comparison
- Original data preserved for "Back" button functionality

2. Review Redacted Content

- Verify all sensitive information is properly redacted
- Check that non-sensitive information remains intact

3. Make Manual Edits (if needed)

- Content area is fully editable
- Make any adjustments before sending

4. View Images

- Click any image to open full-size modal
- Compare original vs. redacted versions
- Close modal with X button

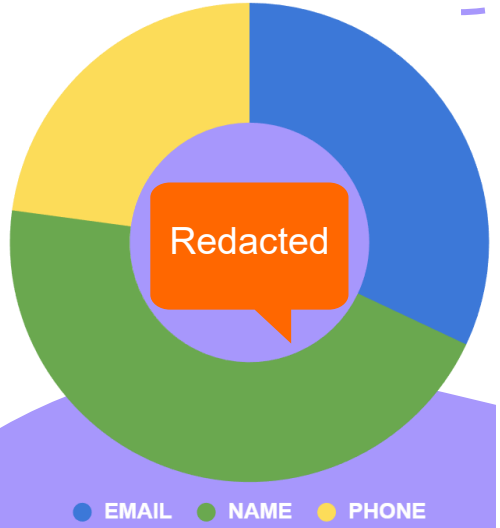
5. Send Email

- Email sent via configured service (Mailpit/Resend/Brevo)
- Images attached if present
- Redirects to success page

6. Go Back

- Returns to compose page
- All original data restored (unredacted content, original images)
- Can modify settings and redact again

Preview Email Features



Preview Redacted Email

To:
john@yahoo.com

CC:
martha@gmail.com

Subject:
Redacted email sample

Redacted Content (Editable):

```
Date: February 14, 2026
Reported By: [NAME] (Operations Manager)
Email: [EMAIL]
Phone: [PHONE]

INCIDENT SUMMARY:
On Monday morning, an external contractor named [NAME] visited the
site.
[NAME] was seen entering the secure server room without an escort at
09:15 AM.
When questioned by [NAME] from the Security Department, the contractor
claimed he was sent by 'Vertex Solutions' to check a hardware fault.

FOLLOW-UP ACTIONS:
1. Contact Vertex Solutions at [EMAIL] to verify the work order.
2. Confirm [NAME]'s ID number: [ID].
3. Send a summary to the Director's personal assistant, [NAME], at
   [EMAIL] for internal audit tracking.
```

AI Feedback:

```
[22:51:12] Connecting to Groq API for text redaction...
[22:51:12] Sending text to Groq API (Llama 3.3 70B)...
[22:51:12] Groq API: Text redaction complete (892 tokens used)
[22:51:12] Processing 2 image(s) with OCR.space...
```

Real-time AI Feedback:
Live status updates during redaction process

Original Content:

```
CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026
Reported By: Sarah Jenkins
(Operations Manager)
Email: s.jenkins@confidential-
edge.com
Phone: (555) 012-8843

INCIDENT SUMMARY:
On Monday morning, an external
contractor named Mark Thompson
visited the site.
Mr. Thompson was seen entering
the secure server room without an
escort at 09:15 AM.
When questioned by David Miller
from the Security Department, the
contractor
claimed he was sent by 'Vertex
```

Redacted Images:

← Back

Send Email

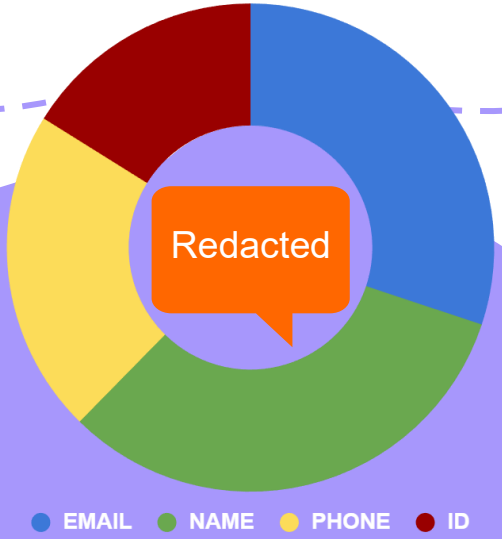
Preview Email Features

Interactive Preview button: opens side-by-side comparison window with original vs redacted email

Original Content:

```
CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026
Reported By: Sarah Jenkins
```



Compare Content

Redacted Content

```
CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026
Reported By: [NAME] (Operations Manager)
Email: [EMAIL]
Phone: [PHONE]

INCIDENT SUMMARY:
On Monday morning, an external contractor named [NAME] visited the site.
[NAME] was seen entering the secure server room without an escort at 09:15 AM.
When questioned by [NAME] from the Security Department, the contractor
claimed he was sent by 'Vertex Solutions' to check a hardware fault.

FOLLOW-UP ACTIONS:
1. Contact Vertex Solutions at [EMAIL] to verify the work order.
2. Confirm [NAME]'s ID number: [ID].
3. Send a summary to the Director's personal assistant, [NAME], at
   [EMAIL] for internal audit tracking.

End of Report.
```

Original Content

```
CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026
Reported By: Sarah Jenkins (Operations Manager)
Email: s.jenkins@confidential-edge.com
Phone: (555) 012-8843

INCIDENT SUMMARY:
On Monday morning, an external contractor named Mark Thompson visited the site.
Mr. Thompson was seen entering the secure server room without an escort at 09:15 AM.
When questioned by David Miller from the Security Department, the contractor
claimed he was sent by 'Vertex Solutions' to check a hardware fault.

FOLLOW-UP ACTIONS:
1. Contact Vertex Solutions at support@vertex-sol.net to verify the work order.
2. Confirm Mark's ID number: TX-99420-B.
3. Send a summary to the Director's personal assistant, Emily Rose, at
   emily.rose_temp@gmail.com for internal audit tracking.

End of Report.
```

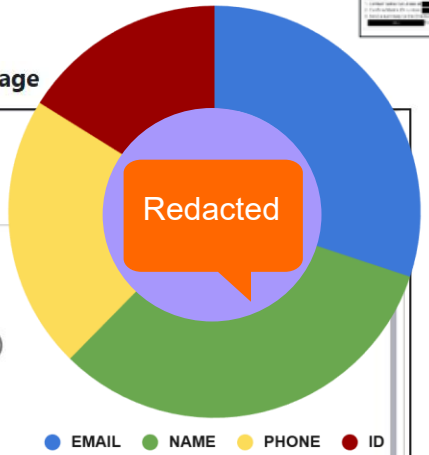
Preview Email Features

Image Comparison Viewer: click image to open side-by-side comparison window with original vs redacted image

Redacted Images:

Redacted Image

Original Image



Content:

CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026
Reported By: [NAME] (Operations Manager)
Email: [EMAIL]
Phone: [PHONE]

INCIDENT SUMMARY:
On Monday morning, an external contractor named [NAME] visited the site. Mr. [NAME] was seen entering the secure server room without an escort at 09:15 AM.
When questioned [NAME] Miller from the Security Department, the contractor claimed he was sent by 'Vertex Solutions' to check a hardware fault.

FOLLOW-UP ACTIONS:
1. Contact Vertex Solutions at [EMAIL] to verify the work order.
2. Confirm [NAME] ID number: [ID]
3. Send a summary to the Director's personal [NAME] Rose, at [EMAIL] for internal audit tracking.

Content:

CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026
Reported By: Sarah Jenkins (Operations Manager)
Email: s.jenkins@confidential-edge.com
Phone: (555) 012-8843

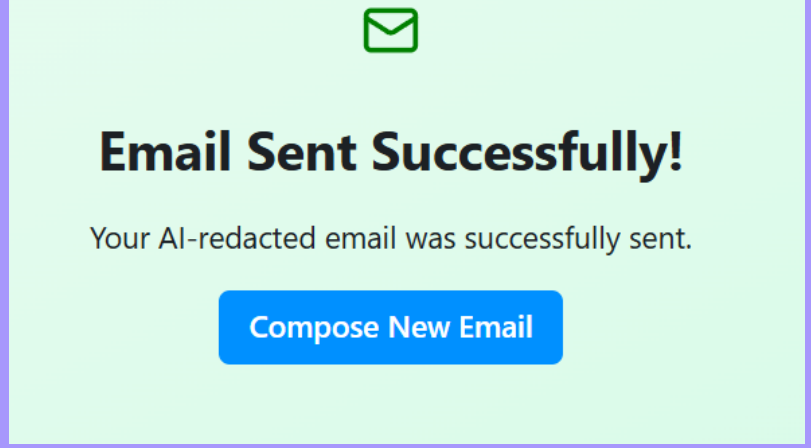
INCIDENT SUMMARY:
On Monday morning, an external contractor named Mark Thompson visited the site. Mr. Thompson was seen entering the secure server room without an escort at 09:15 AM.
When questioned by David Miller from the Security Department, the contractor claimed he was sent by 'Vertex Solutions' to check a hardware fault.

FOLLOW-UP ACTIONS:
1. Contact Vertex Solutions at support@vertex-sol.net to verify the work order.
2. Confirm Mark's ID number: TX-99420-B.
3. Send a summary to the Director's personal assistant, Emily Rose, at emily.rose_temp@gmail.com for internal audit tracking.

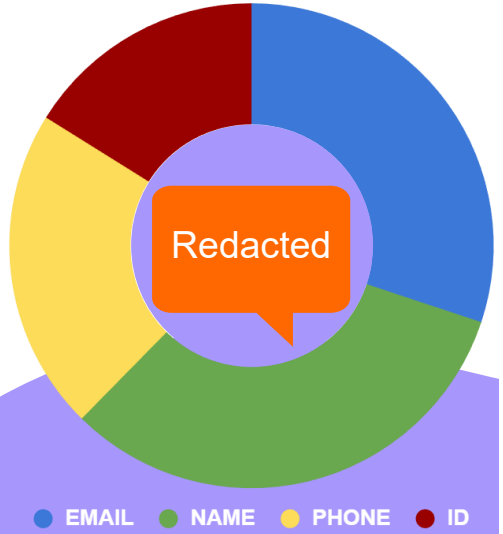
Send Email
Features

Confirmation

- Success message
- Option to send another email



Send Email
Features



Gmail

Vlad Koval <vkoval@gmail.com>

Redacted email sample
1 message

onboarding@resend.dev <onboarding@resend.dev>
To: vkoval@gmail.com

Fri, Jan 30, 2026 at 6:30 PM

CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026
Reported By: [NAME] (Operations Manager)
Email: [EMAIL]
Phone: [PHONE]

INCIDENT SUMMARY:
On Monday morning, an external contractor named [NAME] visited the site.
[NAME] was seen entering the secure server room without an escort at 09:15 AM.
When questioned by [NAME] from the Security Department, the contractor claimed he was sent by 'Vertex Solutions' to check a hardware fault.

FOLLOW-UP ACTIONS:
1. Contact Vertex Solutions at [EMAIL] to verify the work order.
2. Confirm [NAME]'s ID number: [ID].
3. Send a summary to the Director's personal assistant, [NAME], at [EMAIL] for internal audit tracking.

End of Report.

2 attachments

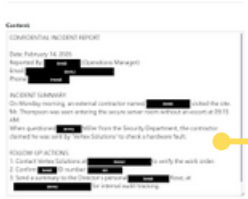


image_1.p
215K

image_2.png
276K

Redacted attachment

Content:

CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026
Reported By: [NAME] (Operations Manager)
Email: [EMAIL]
Phone: [PHONE]

INCIDENT SUMMARY:
On Monday morning, an external contractor named [NAME] visited the site. [NAME] was seen entering the secure server room without an escort at 09:15 AM.
When questioned [NAME] Miller from the Security Department, the contractor claimed he was sent by 'Vertex Solutions' to check a hardware fault.

FOLLOW-UP ACTIONS:
1. Contact Vertex Solutions at [EMAIL] to verify the work order.
2. Confirm [NAME] ID number: [ID]
3. Send a summary to the Director's personal [NAME] Rose, at [EMAIL] for internal audit tracking.

Real-World Use Cases

	Healthcare & HIPAA Compliance	Financial Services	Customer Support	Legal & Compliance	Human Resources	Screenshot Sharing	GDPR Compliance
Scenario	Healthcare provider needs to forward patient inquiry to specialist	Bank representative sharing account inquiry with compliance team	Support agent needs to escalate ticket with customer information	Lawyer forwarding case-related email with client information	HR sharing employee inquiry with management	Developer sharing error screenshot containing API keys	European company sharing customer data inquiry
Solution	Automatically redact patient names, SSNs, medical record IDs, addresses	Redacts account numbers, credit card numbers, SSNs, dollar amounts	Redacts names, emails, phone numbers, account numbers	Redacts client names, addresses, SSNs, case IDs	Redacts employee IDs, SSNs, addresses, salary information	OCR extracts text, AI identifies and redacts API keys, tokens, credentials	Automatically redacts all PII (names, emails, addresses, IDs)
Benefit	Ensures HIPAA compliance while maintaining email context	Protects customer financial data per PCI-DSS requirements	Privacy protection while maintaining ticket context	Attorney-client privilege protection	Employee privacy compliance	Prevents accidental credential exposure	GDPR-compliant data sharing

Product Technical Features

State Management

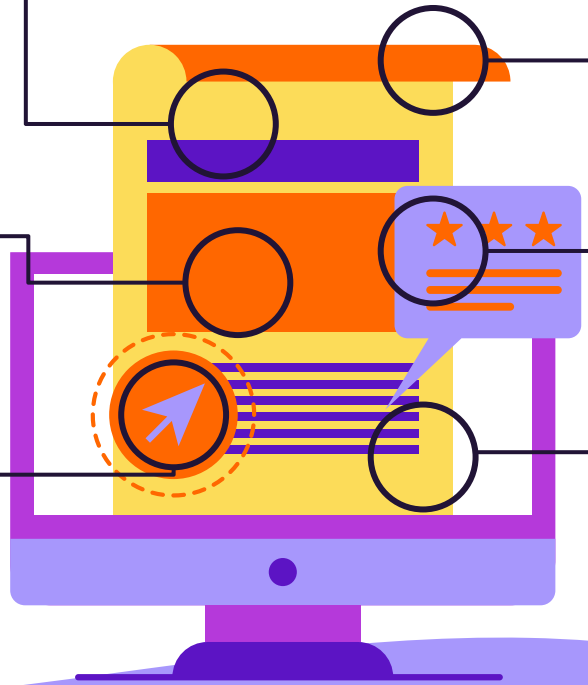
Persistent state across navigation with "Back" button support

Async Processing

Non-blocking API calls for smooth user experience

Multiple Email Providers

Supports Mailpit (dev), Resend API, and Brevo (production)



Base64 Image Handling

Efficient client-side image processing

OCR Integration

Advanced text extraction from images with bounding box coordinates

AI Classification

Sophisticated prompt engineering for accurate data type detection

Technology Stack

Frontend & Framework

- **Reflex** - Python web framework
- Built on React/Next.js
- Component-based architecture
- Reactive state management
- Server-side rendering (SSR)

AI & Machine Learning

- **Groq API** - Ultra-fast LLM inference
- Text classification and redaction in both email content and OCR-extracted text
- Lightning-fast inference, cost-effective, privacy-focused

OCR (Optical Character Recognition)

- **OCR.space API** - Cloud-based OCR service
- Extracts text with precise bounding box coordinates from images
- Outputs text content + pixel coordinates for accurate redaction boxes

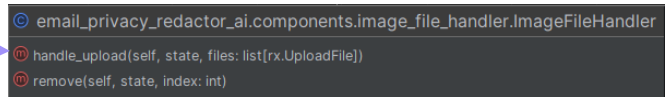
Email Services

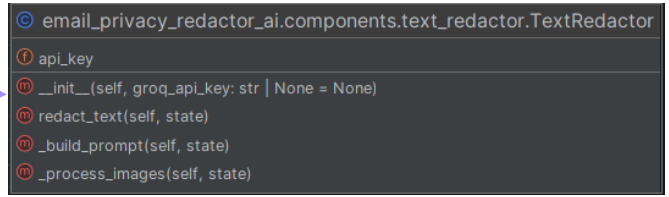
- **Mailpit** - local SMTP testing server for development
- **Resend API** (primary production) - Modern email API
- **Brevo API** (fallback production) - Enterprise email delivery

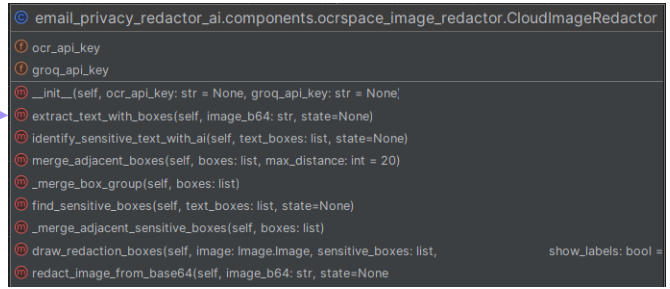
Project Structure

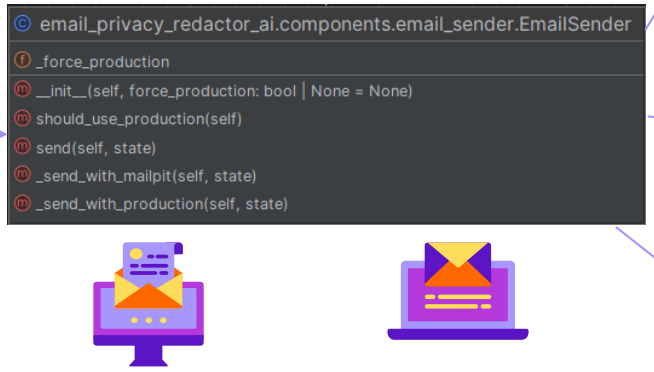
```
EmailPrivacyRedactorAI/
├── email_privacy_redactor_ai/
│   ├── __init__.py
│   ├── email_privacy_redactor_ai.py    # Main state management
│   ├── app.py                          # Reflex app configuration
│   ├── index_page.py                   # Landing page
│   ├── pages/
│   │   ├── email_compose_page.py       # Compose email UI
│   │   ├── email_preview_page.py       # Preview redacted email UI
│   │   └── email_sent_page.py          # Success confirmation page
│   ├── components/
│   │   ├── text_redactor.py            # Groq API text redaction logic
│   │   ├── ocrspace_image_redactor.py  # OCR + AI image redaction
│   │   ├── email_sender.py             # Email sending orchestrator
│   │   ├── image_file_handler.py       # Image upload handling
│   │   ├── mailpit_email_sender.py     # Mailpit email sender
│   │   ├── resend_api_email_sender.py  # Resend API integration
│   │   ├── brevo_api_email_sender.py   # Brevo API integration
│   │   └── ui/
│   │       ├── checkbox_input.py       # Custom checkbox + input component
│   │       └── auto_clear_page_button.py # Auto-clear on refresh component
│   └── assets/
│       ├── Incident_Report_Test.txt    # Sample test content
│       ├── Incident_Report_Test.jpg    # Sample test images
│       ├── Member_Enrollment_Test.txt
│       ├── Member_Enrollment_Test.jpg
│       ├── Service_Activation_Record_Test.txt
│       └── Service_Activation_Record_Test.jpg
├── rxconfig.py                         # Reflex configuration
├── requirements.txt                    # Python dependencies
└── README.md                           # This file
```

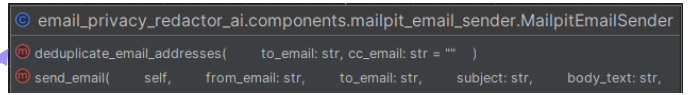
Class Diagram

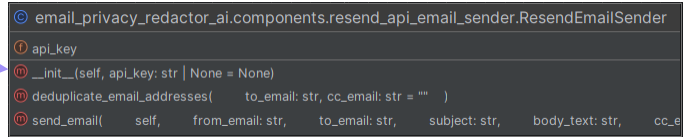


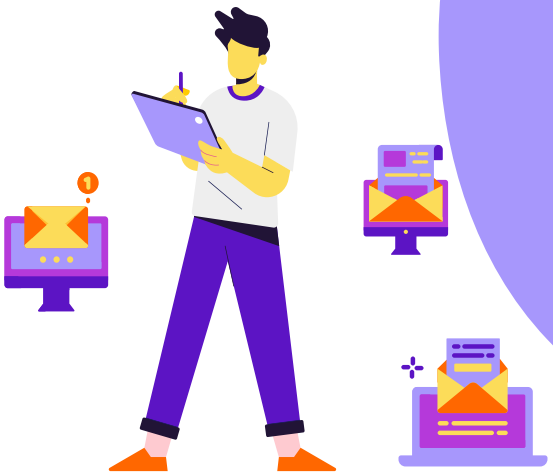




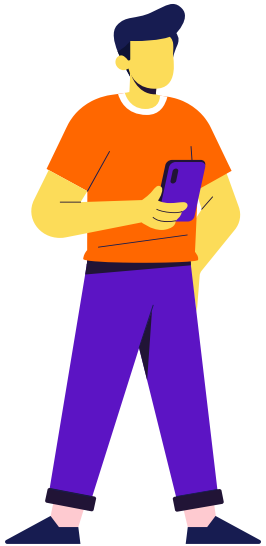








Thank You!



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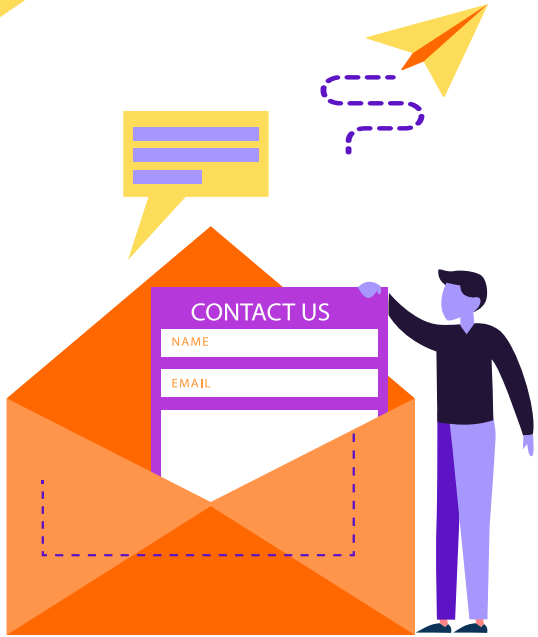

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