Face2QR: A Unified Framework for Aesthetic, Face-Preserving, and Scannable QR Code Generation

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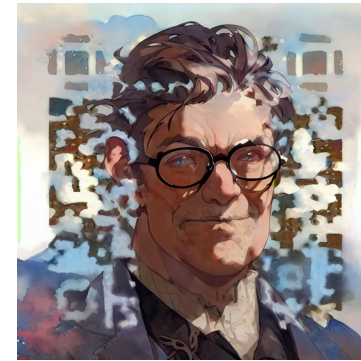* Equal contribution.   [†] Corresponding author.

Motivation

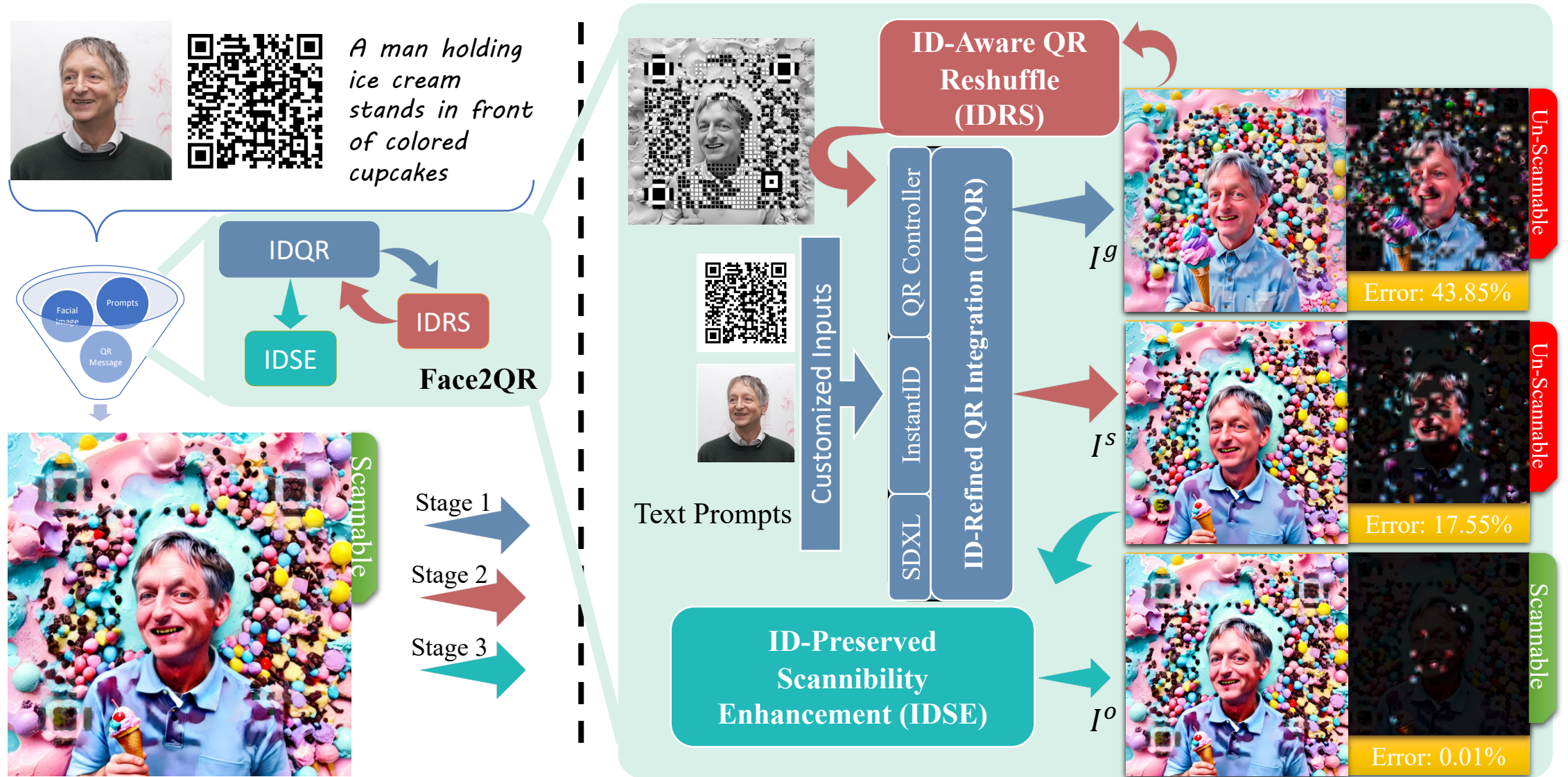

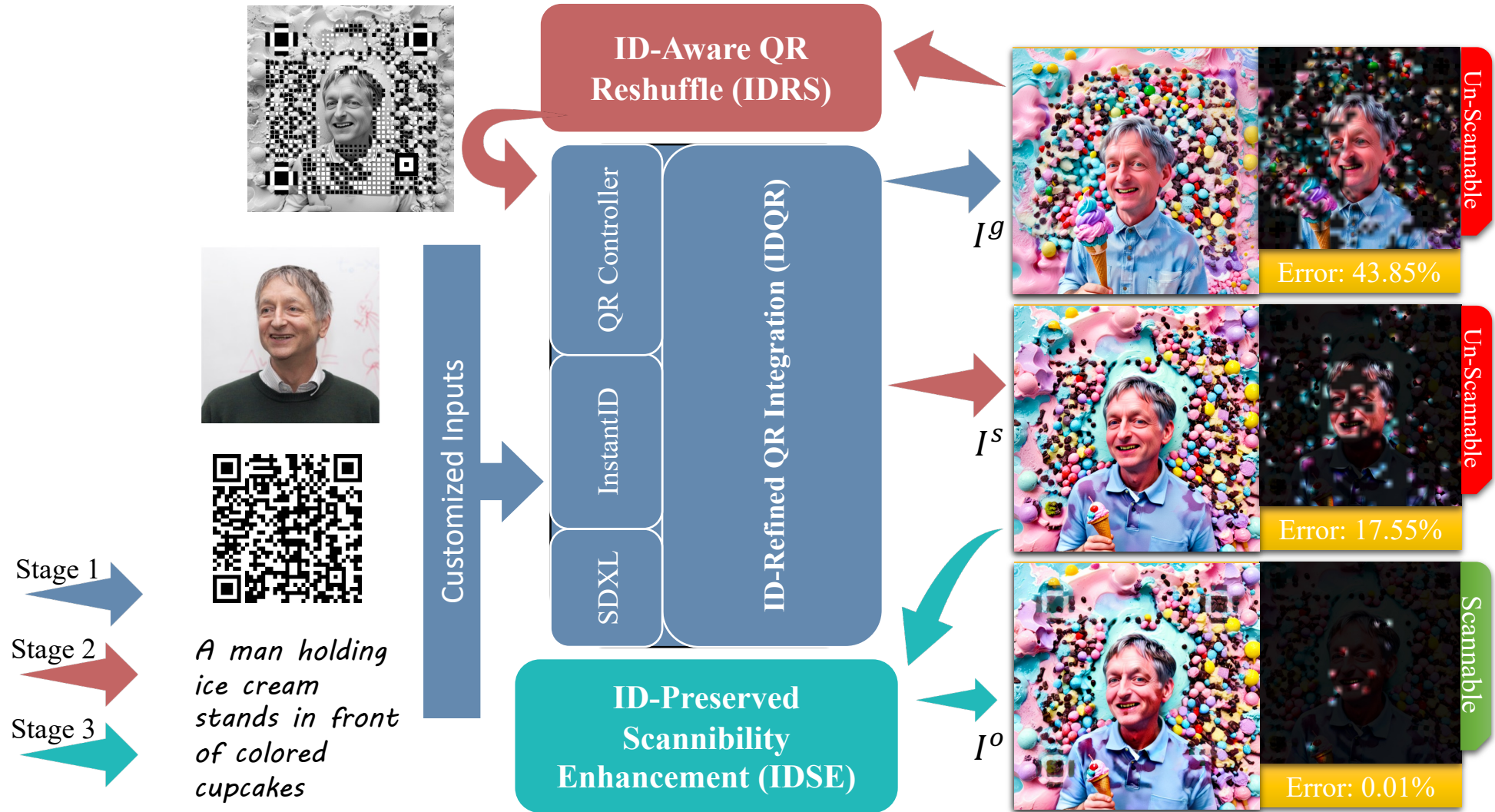Face Image   Traditional Methods   Generative Methods   Face2QR (ours)

➢ There is a growing demand to customize QR codes to include personal identity and aesthetic appeal, which traditional black-and-white codes fail to satisfy.

➢ Existing methods struggle to effectively balance face identity preservation, aesthetic quality and scannability, a challenge addressed by the Face2QR pipeline.
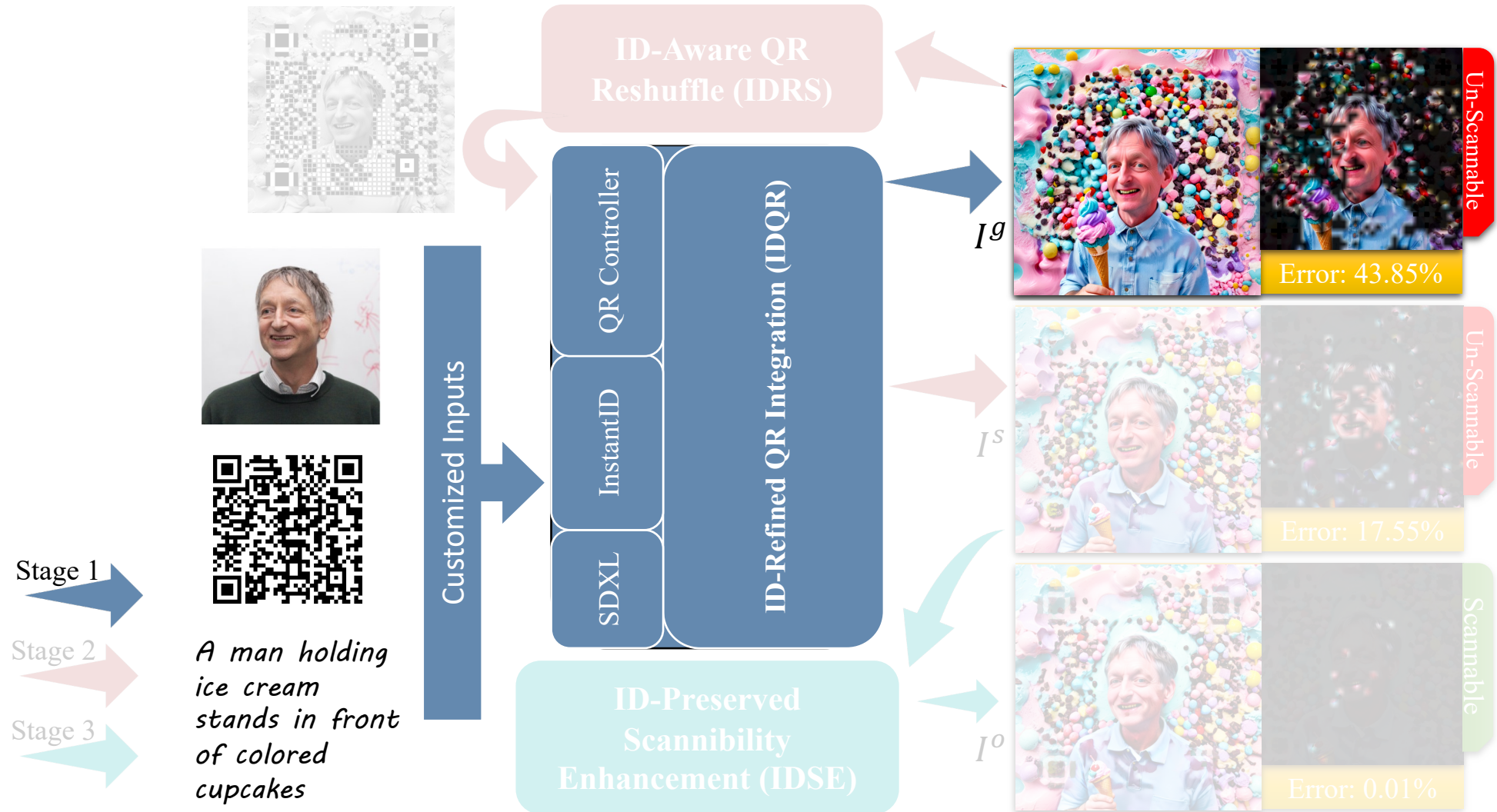
Overall Structure of the Face2QR.

A man holding ice cream stands in front of colored cupcakes

IDQR

IDRS

IDSE

Facial Image

Prompts

QR Message

Face2QR

Scannable

Stage 1

Stage 2

Stage 3

ID-Aware QR Reshuffle (IDRS)

Customized Inputs

QR Controller

InstantID

SDXL

ID-Refined QR Integration (IDQR)

Text Prompts

I^g

Un-Scannable

Error: 43.85%

I^s

Un-Scannable

Error: 17.55%

ID-Preserved Scannibility Enhancement (IDSE)

I^o

Scannable

Error: 0.01%

The pipeline is training-free and end-to-end.

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Un-Scannable

Error: 43.85%

Un-Scannable

Error: 17.55%

Scannable

Error: 0.01%

Stage 1: ID-Refined QR Integration (IDQR)
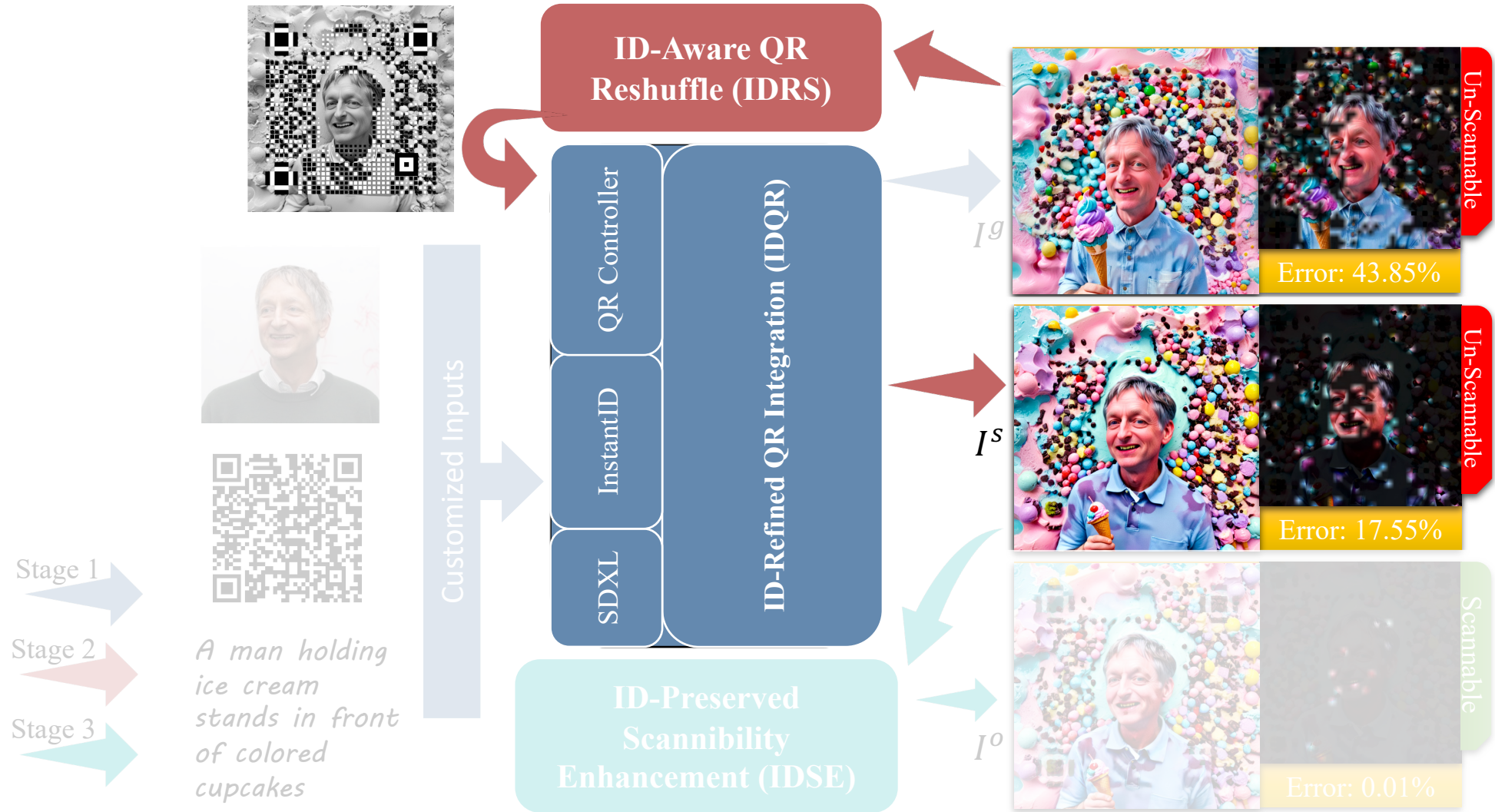
Stage 2: ID-Aware QR Reshuffle (IDRS)

ID-Aware QR Reshuffle (IDRS)

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InstantID

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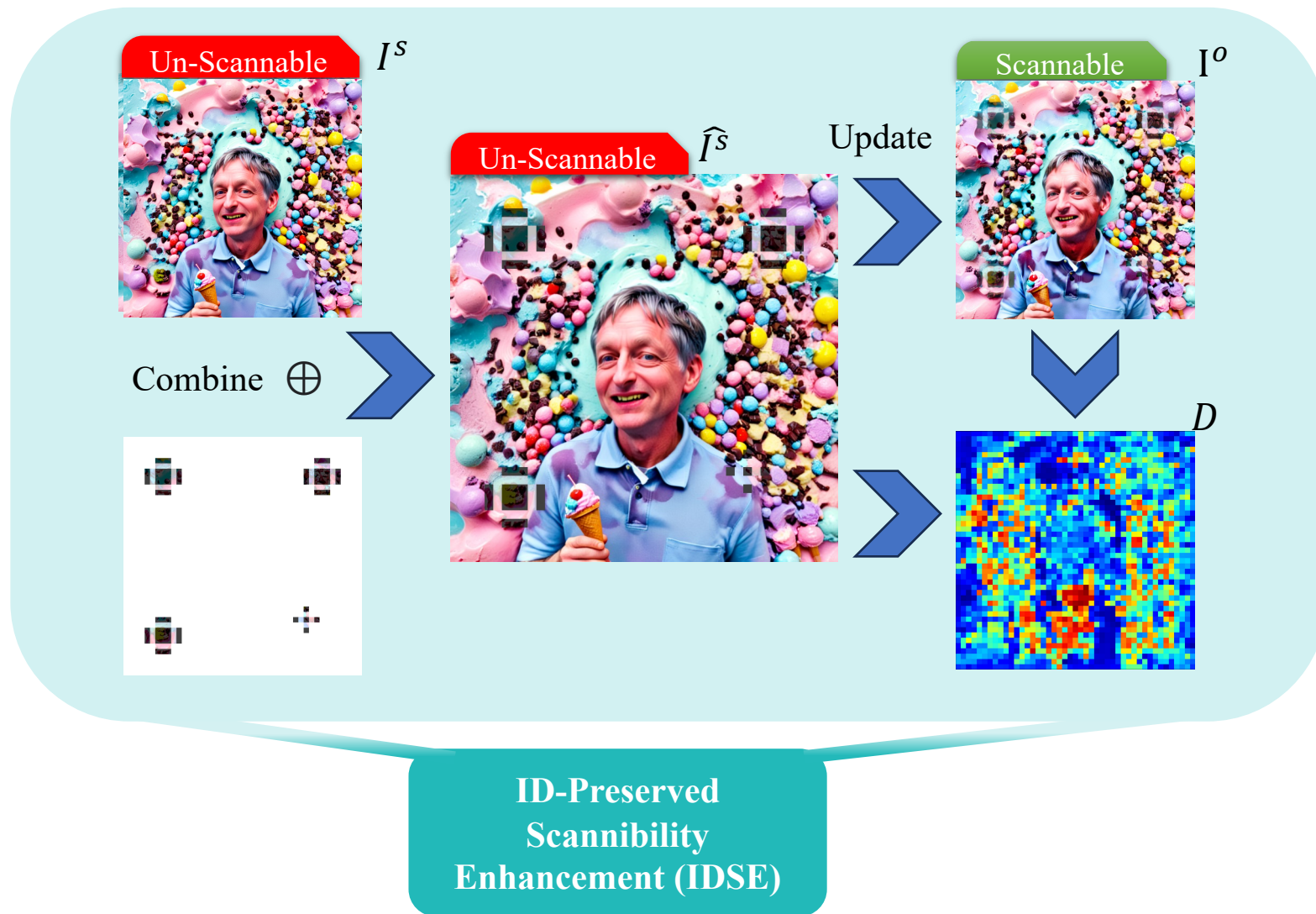# Stage 2: ID-Aware QR Reshuffle (IDRS)
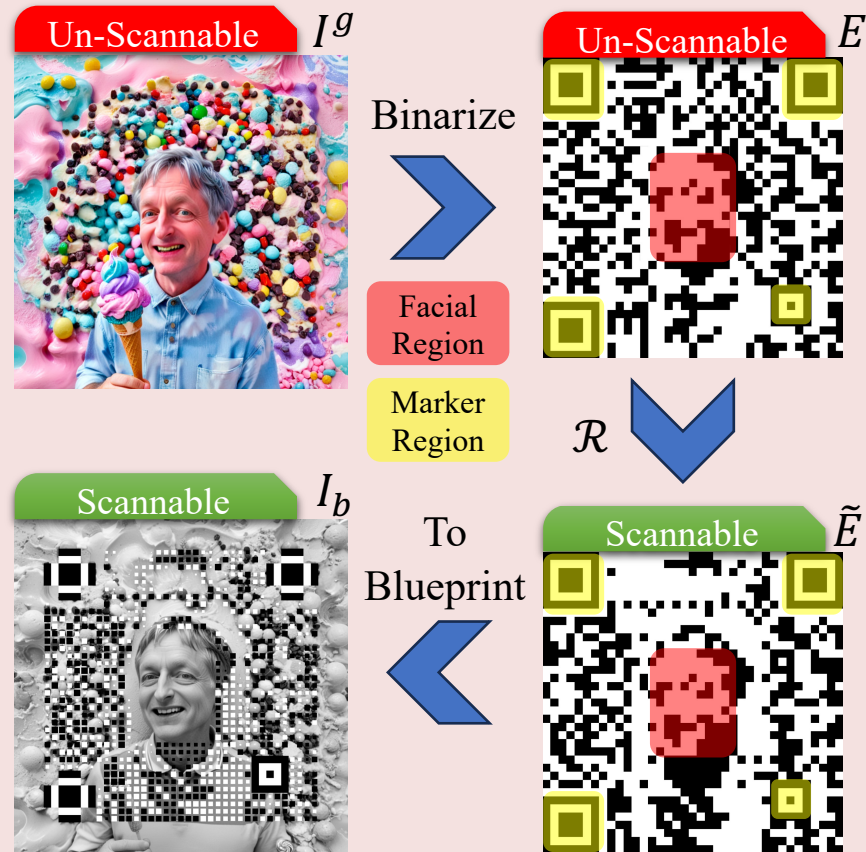
Stage 2: ID-Aware QR Reshuffle (IDRS)
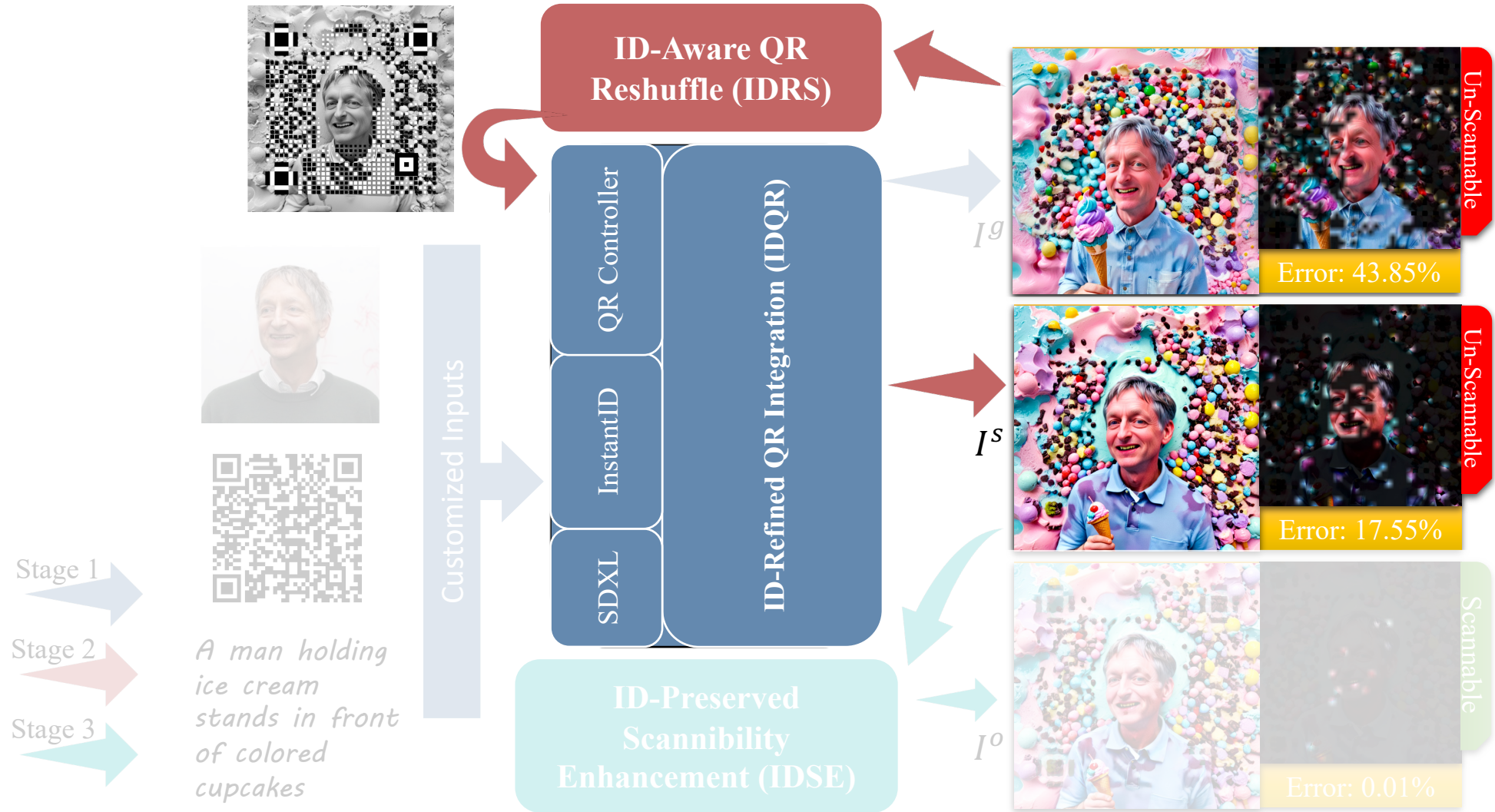
Stage 3: ID-Preserved Scannibility Enhancement (IDSE)
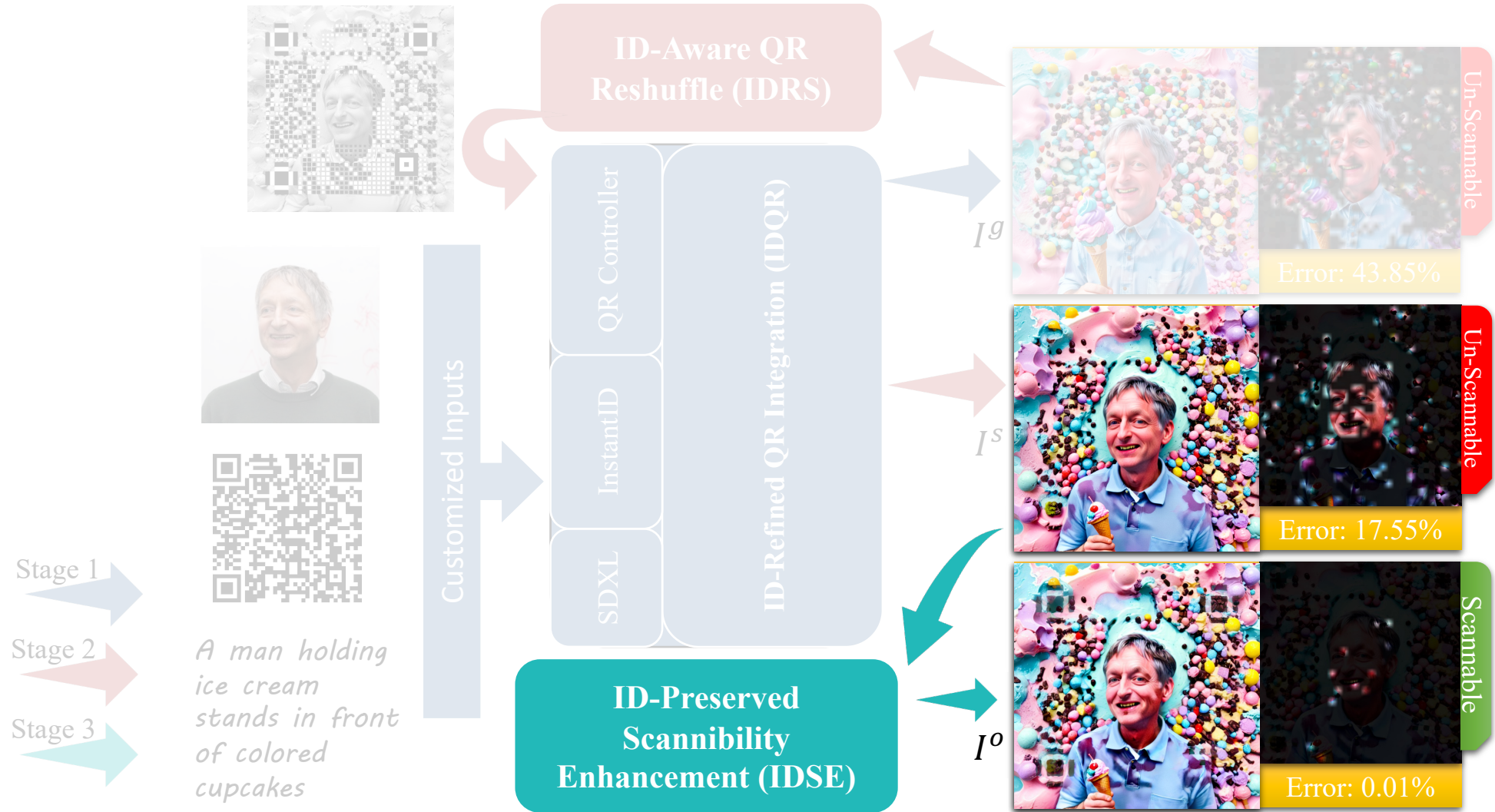
Stage 3: ID-Preserved Scannibility Enhancement (IDSE)

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Sample 1
Iteration 0 (Re-generated Image I^s)
(**Un-scannable**)

Sample 2
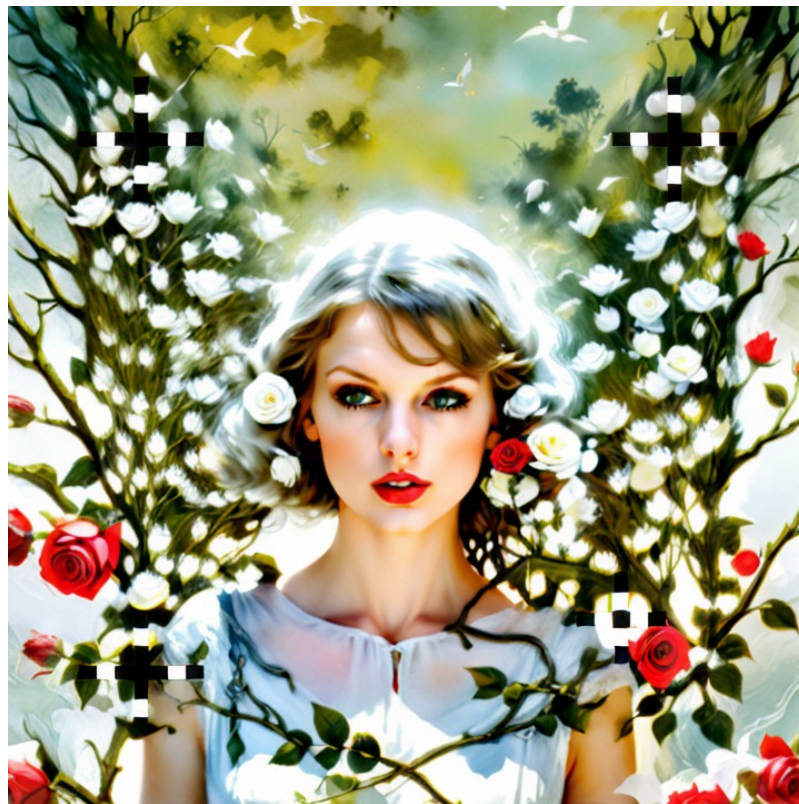Iteration 0 (Re-generated Image I^s)
(**Un-scannable**)

Sample 3
Iteration 0 (Re-generated Image I^s)
(**Un-scannable**)

Stage 3: ID-Preserved Scannibility Enhancement (IDSE)

Sample 1
Iteration 20 (**Un-scannable**)
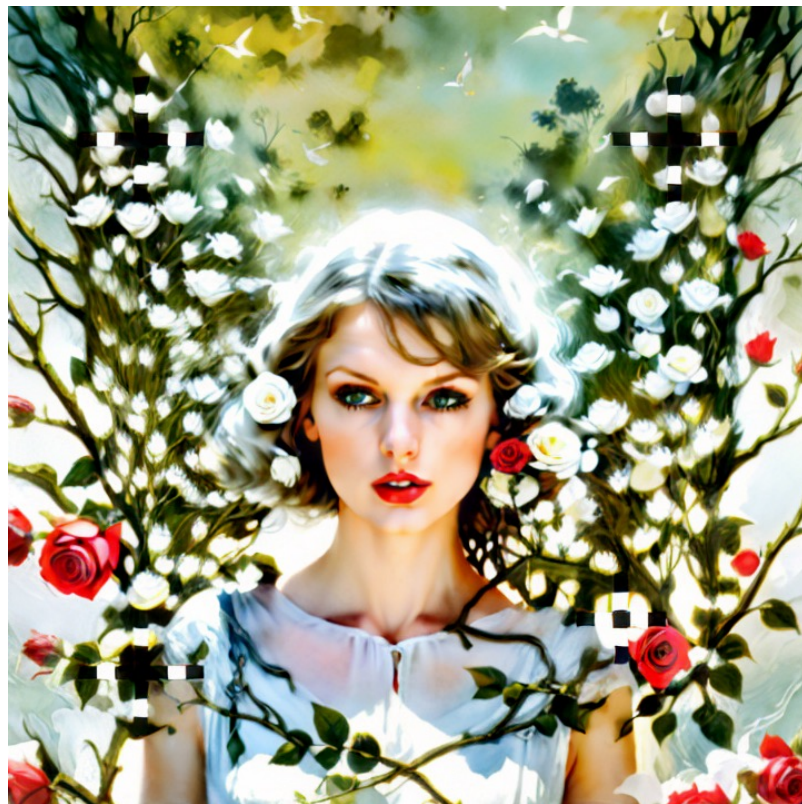
Sample 2
Iteration 20 (**Un-scannable**)

Sample 3
Iteration 20 (**Un-scannable**)

Stage 3: ID-Preserved Scannibility Enhancement (IDSE)

Sample 1
Iteration 40 (Un-scannable)

Sample 2
Iteration 40 (Un-scannable)

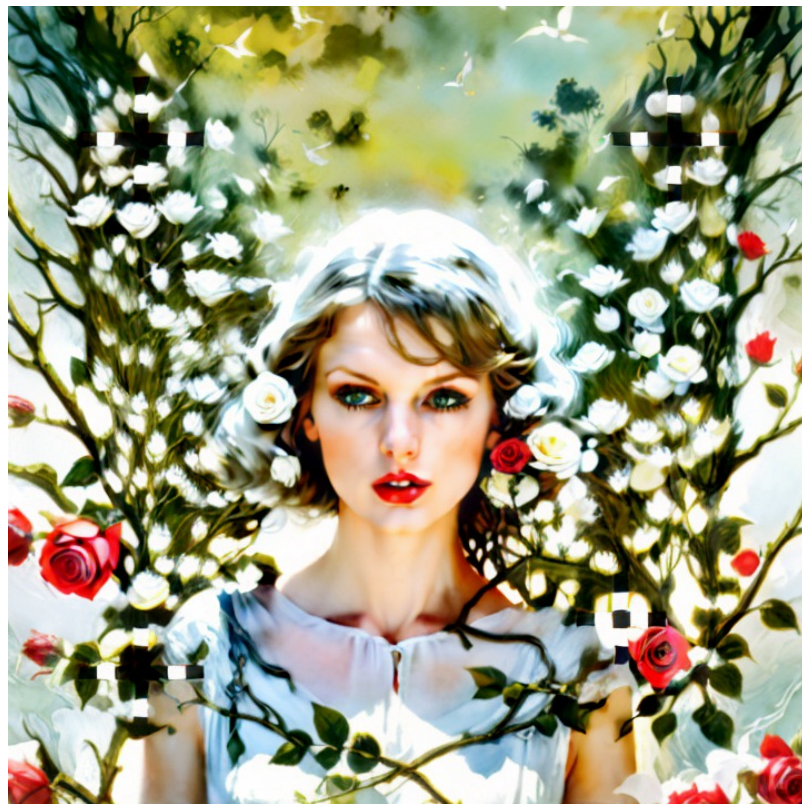Sample 3
Iteration 40 (Un-scannable)

Stage 3: ID-Preserved Scannibility Enhancement (IDSE)

Sample 1
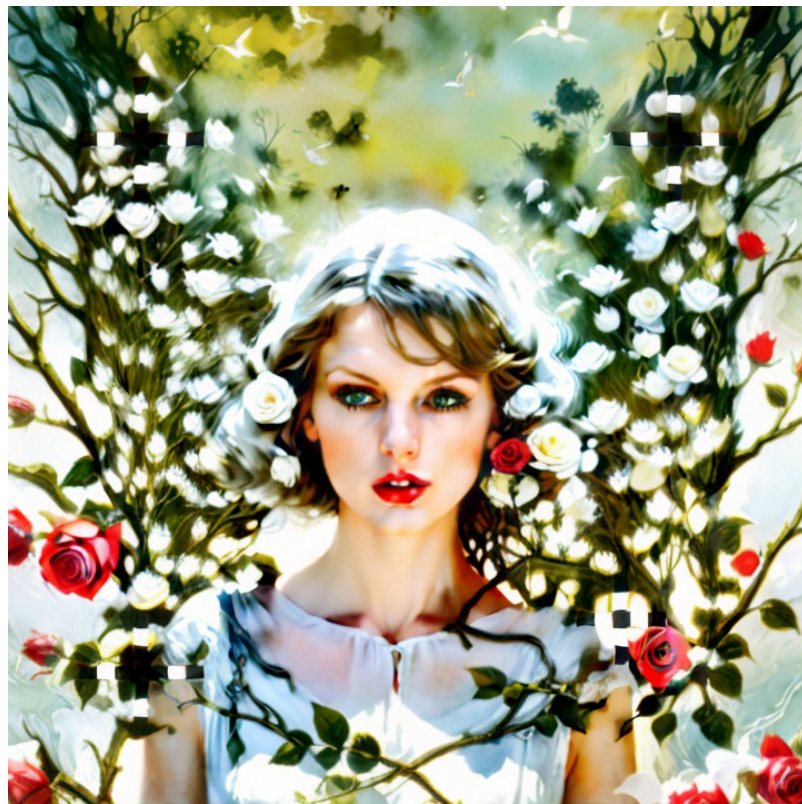Iteration 60 (Scannable)

Sample 2
Iteration 60 (Scannable)

Sample 3
Iteration 60 (Un-scannable)

Stage 3: ID-Preserved Scannibility Enhancement (IDSE)

Sample 1
Iteration 80 (**Scannable**)
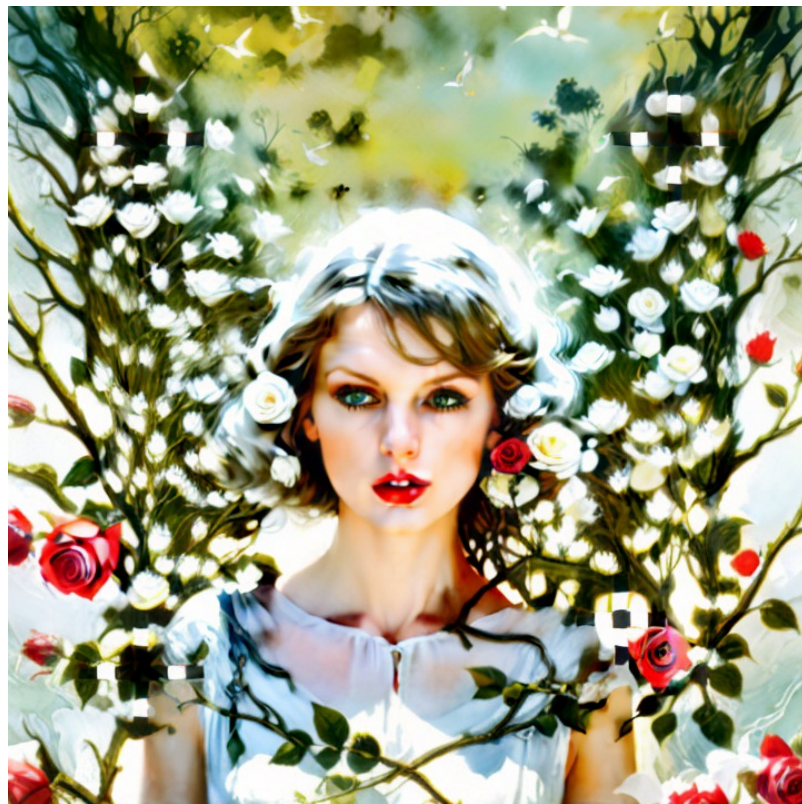
Sample 2
Iteration 80 (**Scannable**)

Sample 3
Iteration 80 (**Scannable**)

Stage 3: ID-Preserved Scannibility Enhancement (IDSE)

Sample 1
Iteration 100 (**Scannable**)

Sample 2
Iteration 100 (**Scannable**)

Sample 3
Iteration 100 (**Scannable**)

Thank you for watching!