Qualcomm

Summary: Resolving the Identity Crisis in Text-to-Image Generation

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https://arxiv.org/abs/2510.01399

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MOTIVATION

Our motivation is to Generate rich synthetic data generation for MultiHuman Task

Why do we need to do T2I?

- To do good Personalized T2I, we need rich data of portrait images of multiple people, which we don't have.
- If we can get that using T2I would solve the problem

What are we looking for in these images:

- They should not be overlapping faces
- Images should look realistic
- The prompt and Image should match

BACKGROUND: THE IDENTITY CRISIS

Gemini-NanoBanana (September 2025)

Flux-Krea (August 2025)

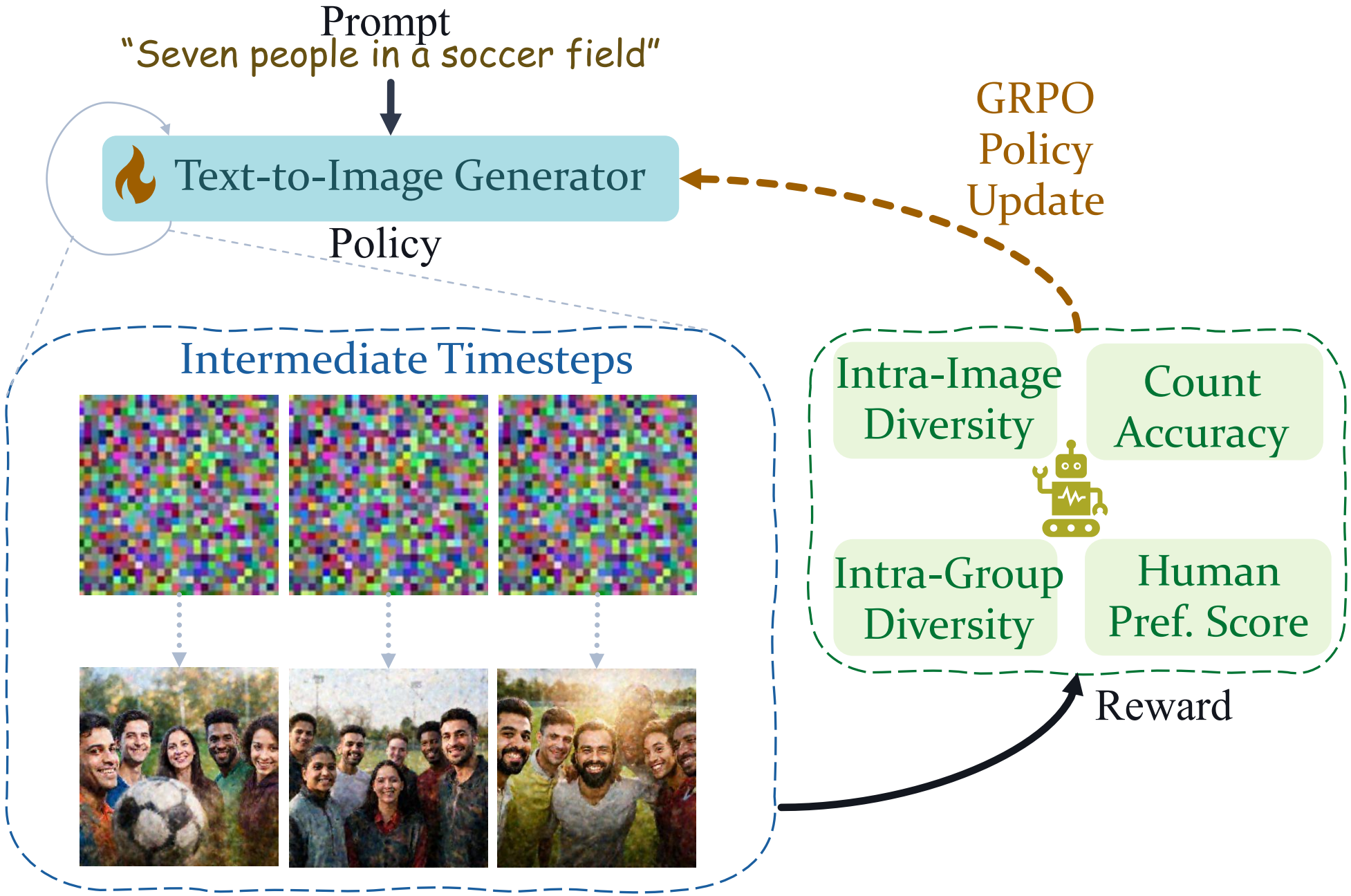
HiDream-Full (April 2025)

OmniGen2 (June 2025)

- To train our SOTA reference-based multi-human generation model, we need high quality data.
- We use SOTA T2I generation models for this purpose.
- SOTA models (including proprietary methods) struggle with the **Identity Crisis.**
- Apart from duplicate identities in the same image, they produce the same faces across the data generation process.
- Additionally, they are inaccurate at generating the correct number of humans.

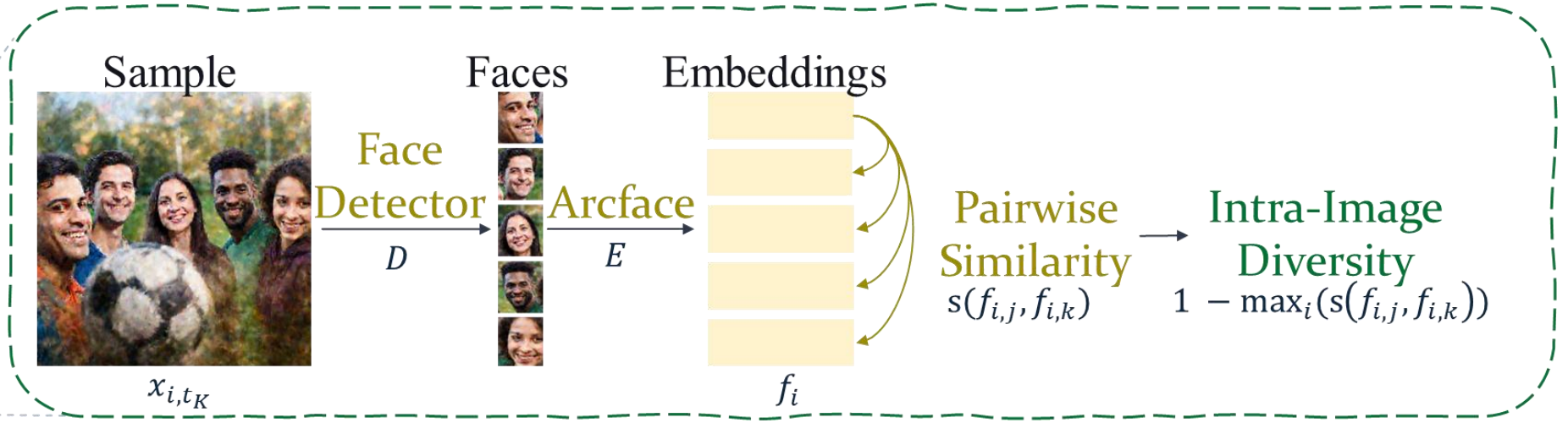
Proposed Method

PROPOSED METHOD

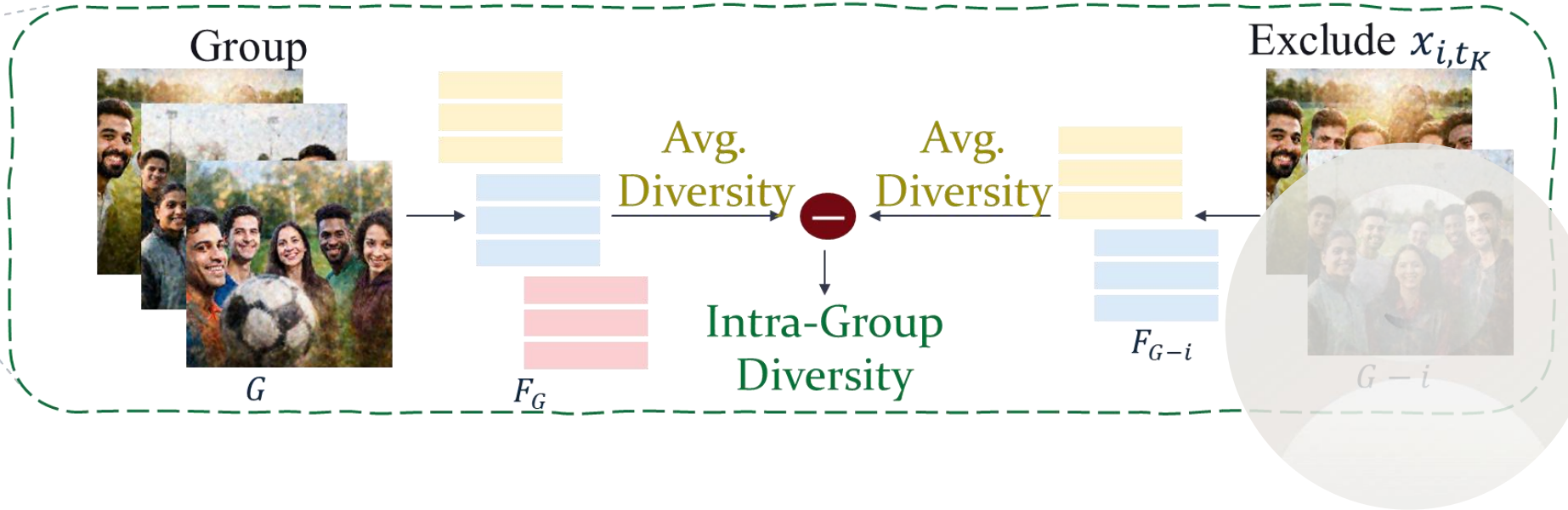


PROPOSED METHOD

Intra-Image Diversity



Intra-Group Diversity

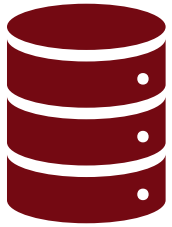


Experiments and Results

TEST DATASETS

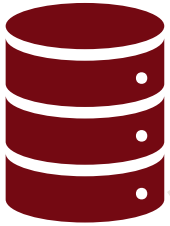
Multi-Human Testbench*

- 1800 samples
- 1-5 People



Diverse-Humans

- 1200 samples
- 2-7 People



25% No tag: Five people on an island cove beach, High dynamic range, Group harmony, Professional portrait, Natural lighting, Smiling expressions

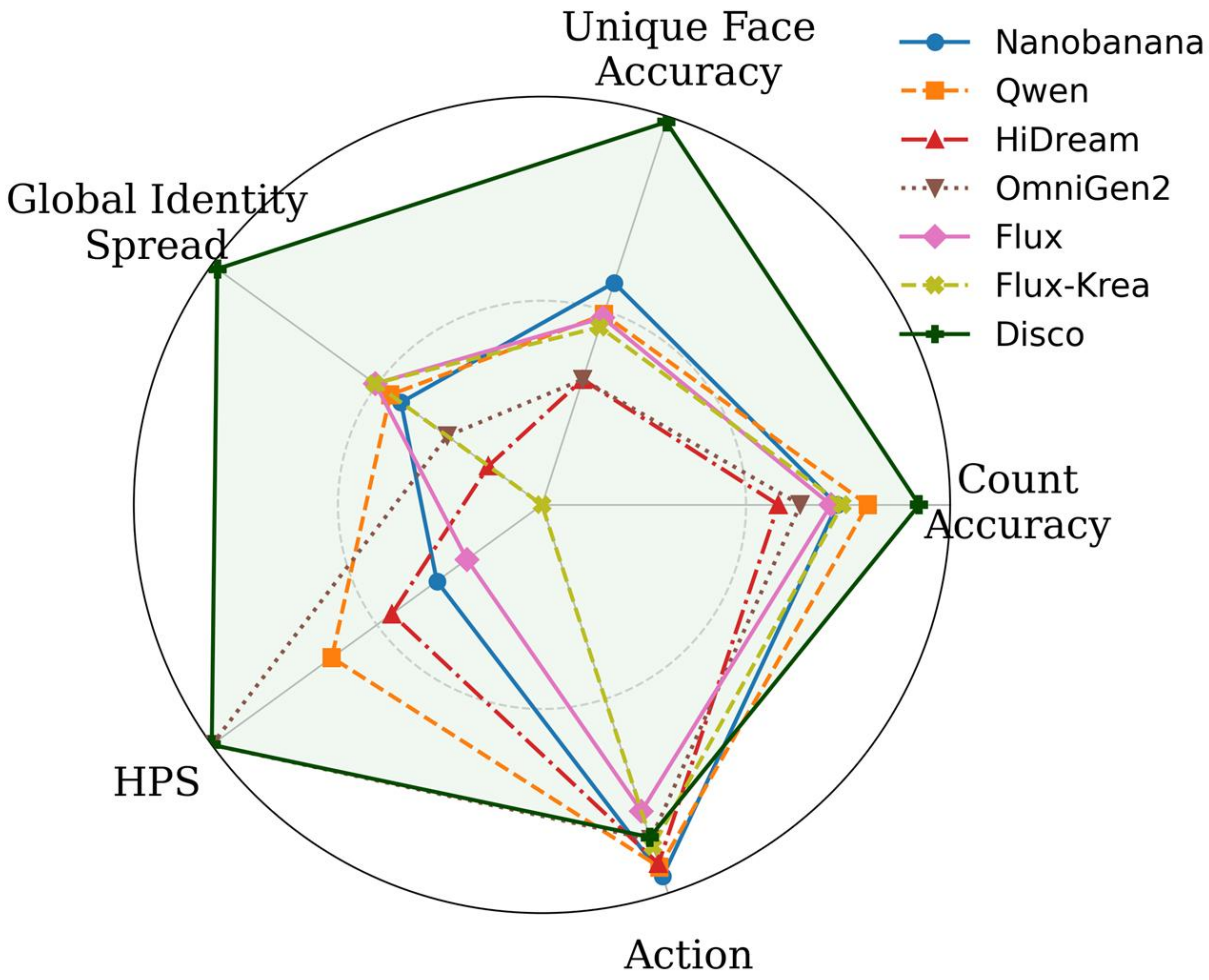
25% Diverse Tag: Five people in an antique arcade, High dynamic range, Sharp focus, Group harmony, Clear faces, Smiling expressions, **Diverse faces among people**

25% Single Ethnicity: Five people in a sidewalk cafe, Sharp focus, Bokeh background, Well lit, Clear faces, Group harmony, **Indian ethnicity**

25% Individual Assignments: Five people in a coastal market, Bokeh background, Sharp focus, Professional portrait, Portrait photography, One person is White, One person is Middle-eastern, One person is Asian, One person is Black, One person is Hispanic

*Source: https://arxiv.org/abs/2506.20879

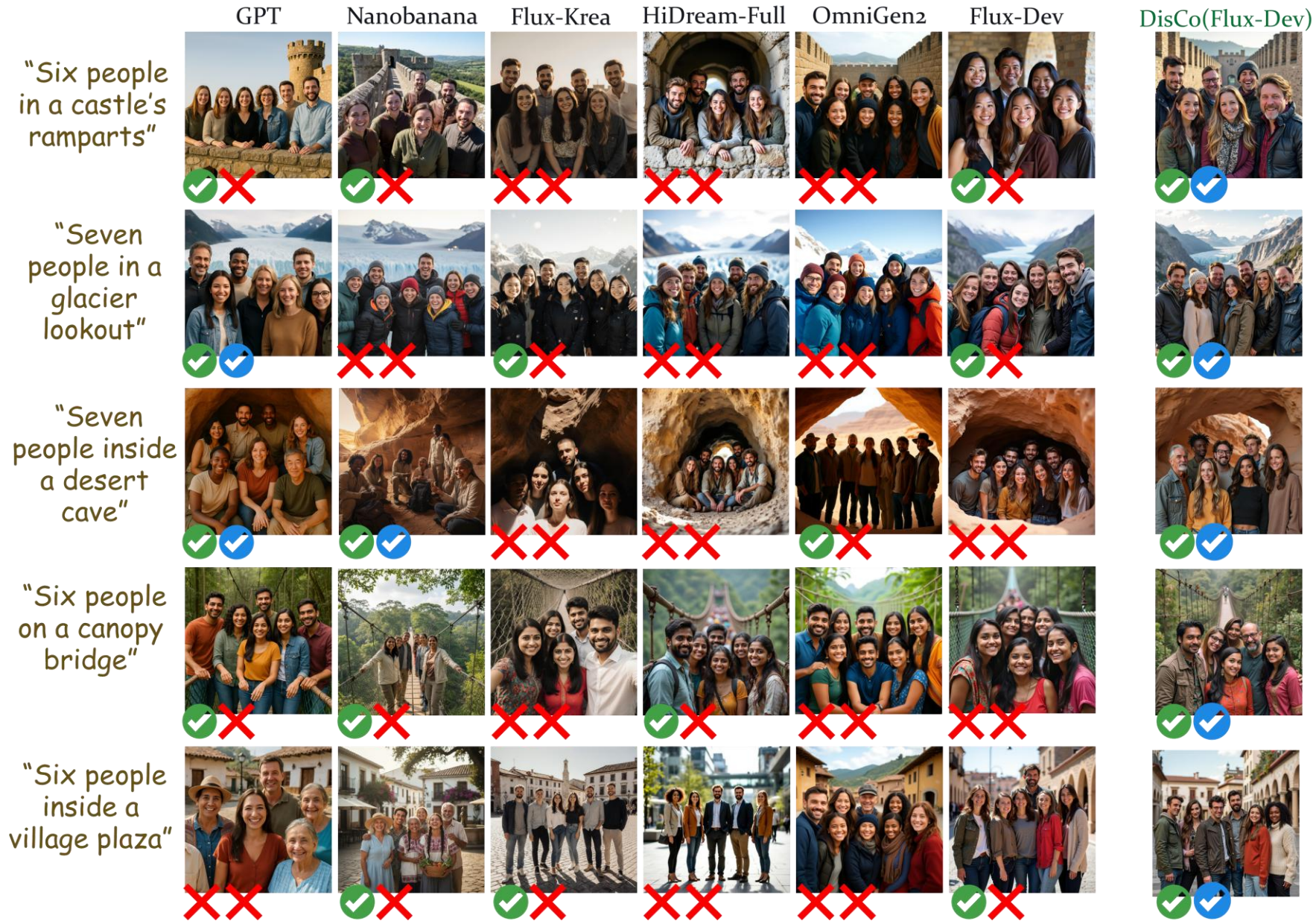
QUANTITATIVE RESULTS



Metrics:

- **Unique Face Accuracy:** Percentage of images without ANY ID overlap
- **Global Identity Spread:** Percentage of new faces across all the generated faces

QUALITATIVE RESULTS (DISCO-FLUX)



QUALITATIVE RESULTS (DIVERSITY ACROSS DATASET)

Prompt	Flux-Dev	+DisCo
"Four people in a park, portrait photography, smiling expressions, Indian ethnicity"		
"Four chefs in a kitchen, portrait photography, smiling expressions, Asian ethnicity"		
"Three people in the snow, portrait photography, smiling expressions, White ethnicity"		

Thank you

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