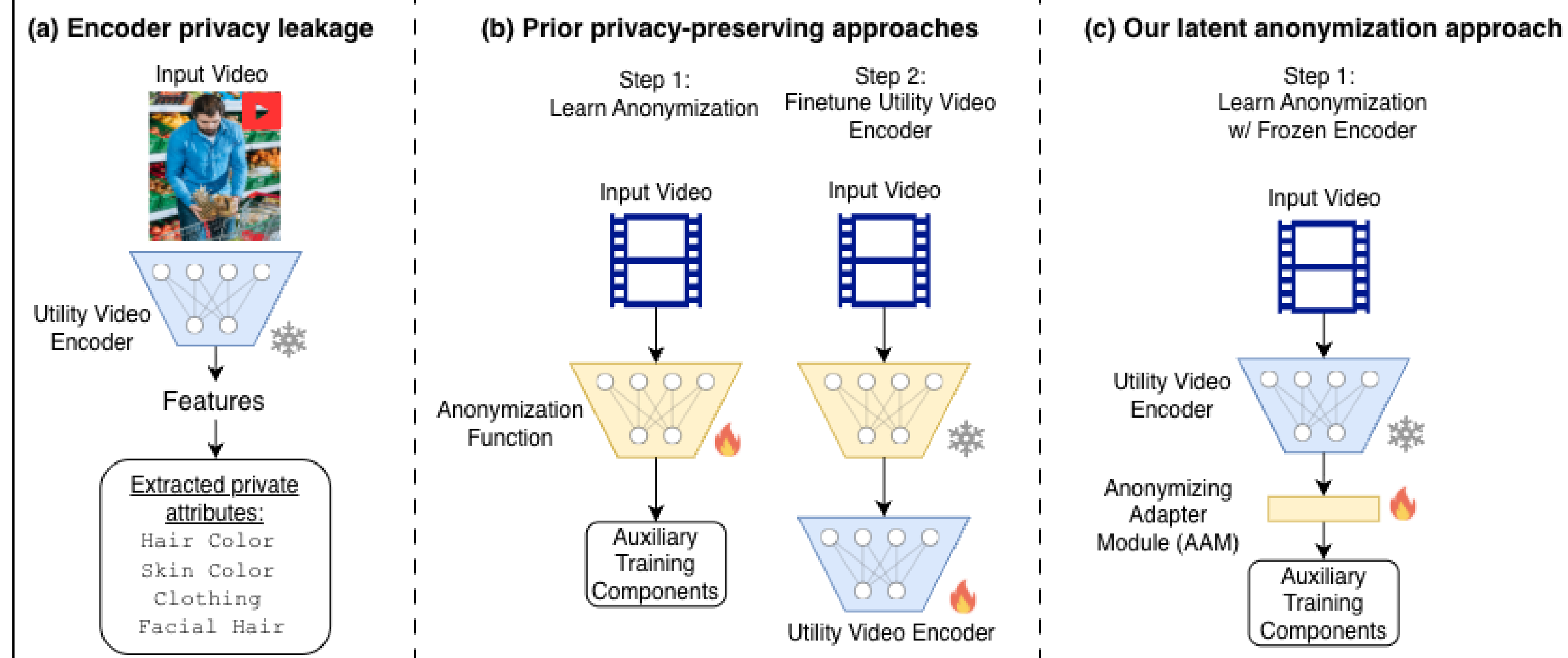


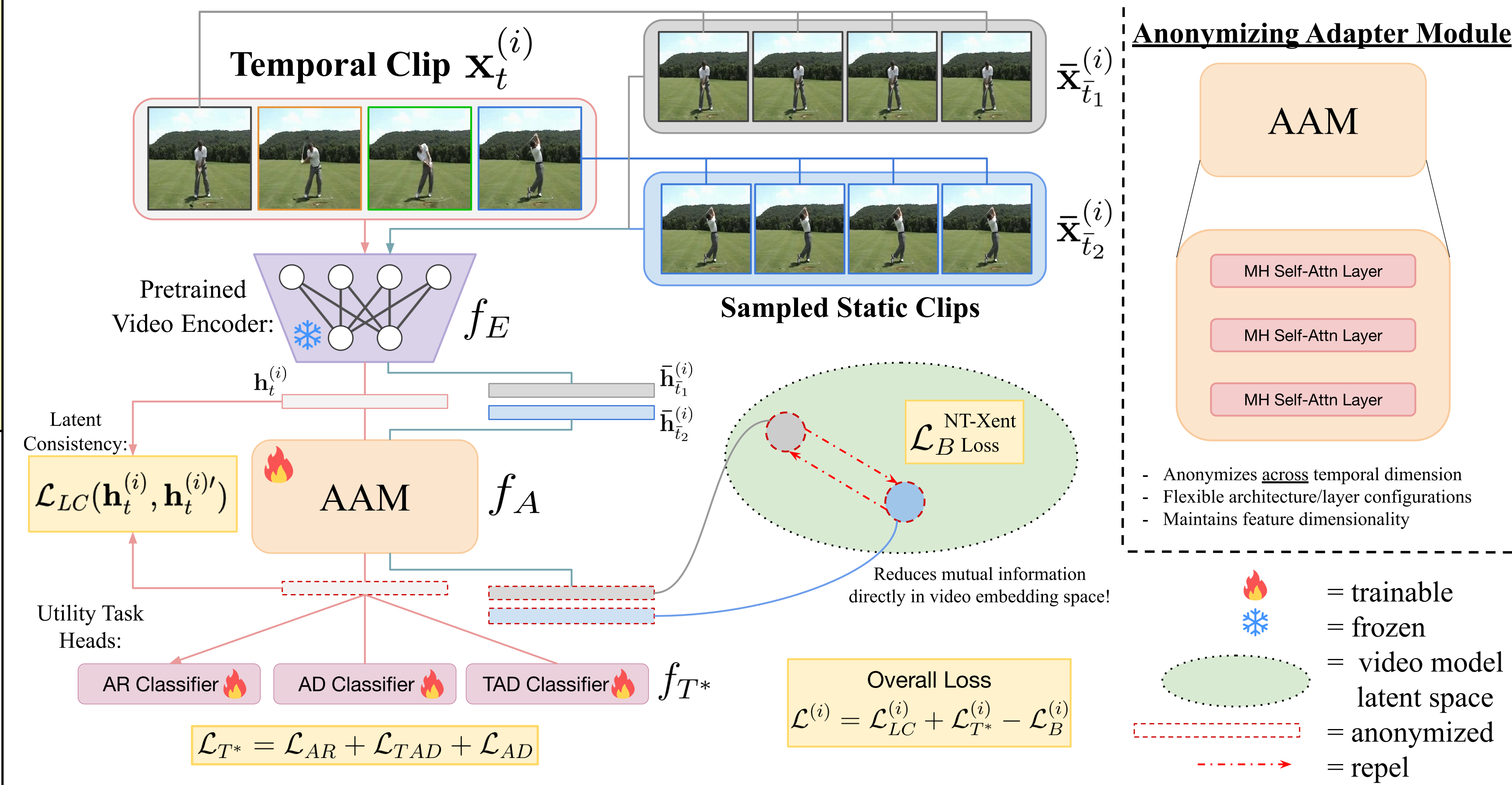
Contributions

- ❖ Formulate video anonymization in the latent space.
- ❖ Propose a clip-level privacy objective + latent consistency loss.
- ❖ Address *multi-task* video privacy preservation for the first time.
- ❖ Reduce privacy leakage by **35%** while maintaining near-full utility performance (within **2%**) across all tasks.
- ❖ Introduce action recognition gender bias evaluation protocols.

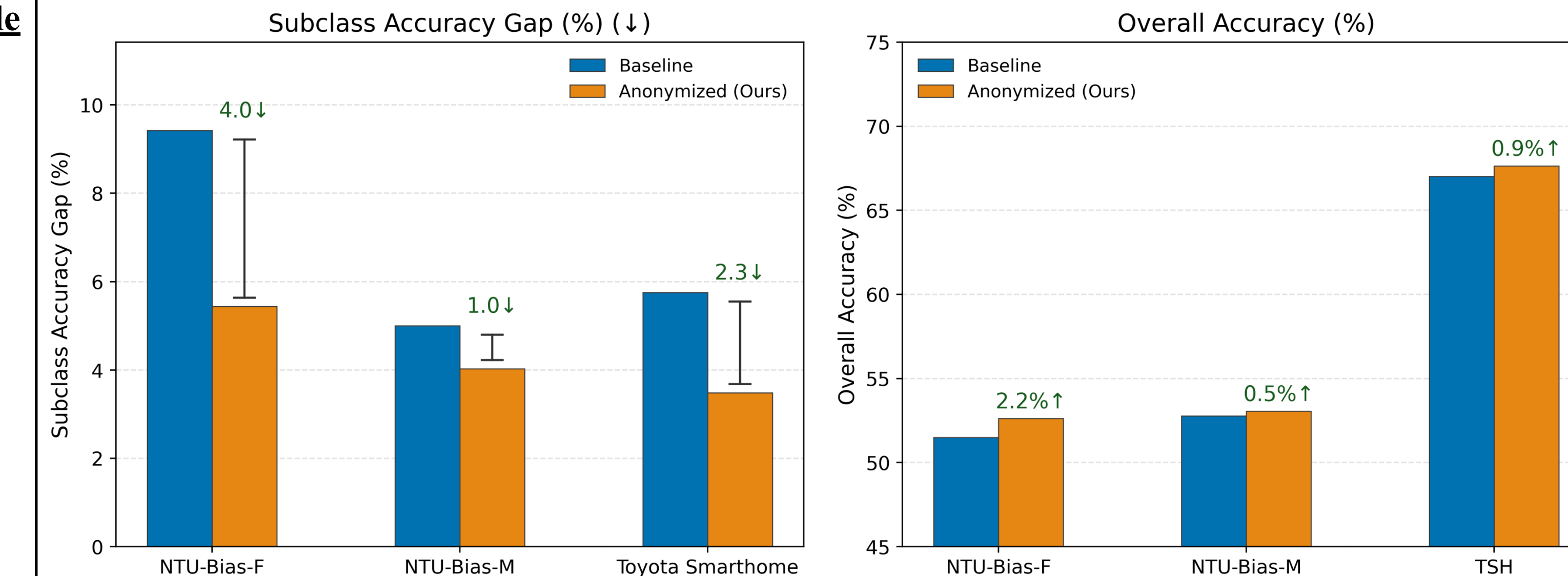
Latent Space Anonymization



Workflow Diagram



Anonymization Can Help Mitigate Gender Bias!

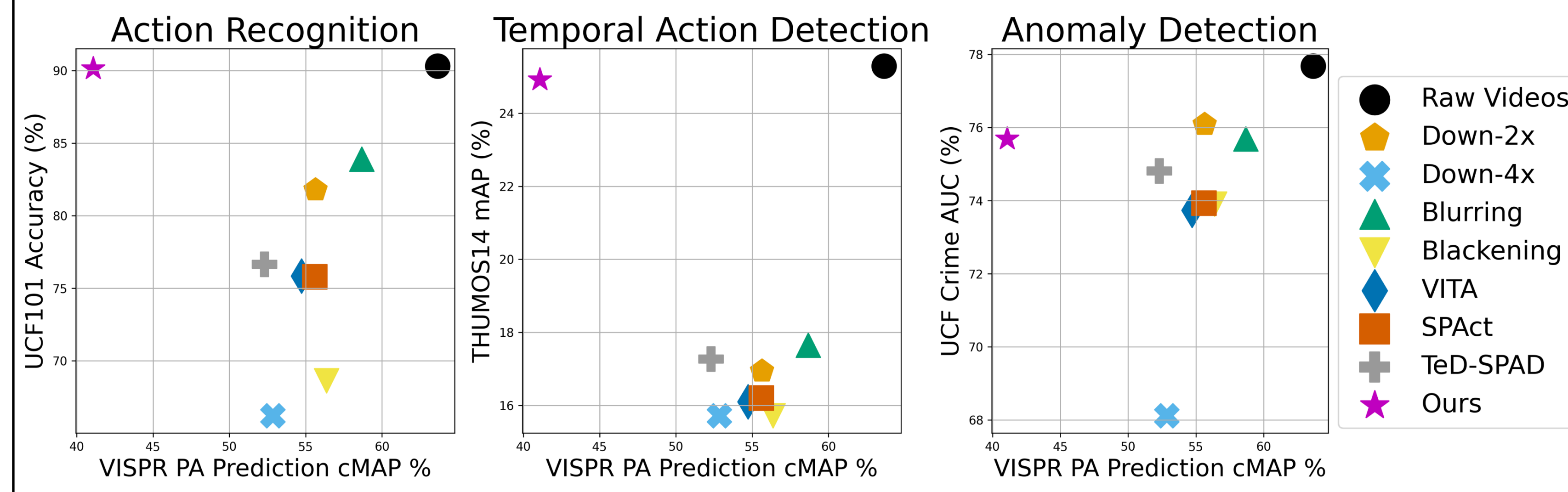


- Action recognition accuracy gap between gendered subclasses reduces after anonymization, while overall accuracy increases.

Results: Privacy Leakage vs. Utility Task Tradeoff

Anonymization Method	Network	Privacy	Action Recognition	Action Recognition	Temporal Action Detection	Anomaly Detection
		VISPR cMAP (↓)	Kin400 Top-1 (↑)	UCF101 Top-1 (↑)	THUMOS14 mAP (↑)	UCF-Crime AUC (↑)
Raw Videos		63.64	62.67	90.30	25.29	77.68
Downsample-2x		55.64	--	81.78	16.94	76.09
Downsample-4x		52.84	--	66.21	15.72	68.12
Blurring		58.68	--	83.90	17.65	75.69
Blackening	I3D	56.36	--	68.62	15.72	73.91
VITA [1]		54.72	--	75.83	16.10	73.74
SPAct		55.60	46.93	75.77	16.20	73.93
TeD-SPAD		52.30	47.20	76.64	17.27	74.81
Ours		41.07↓35.5%	62.11↓0.9%	90.14↓0.2%	24.92↓1.5%	75.69↓2.6%
Raw Videos	VideoMAE-B	70.47	74.86	96.80	60.82	85.79
Ours	VideoMAE-B	49.92↓28.9%	74.23↓0.8%	96.11↓0.7%	60.50↓0.5%	85.08↓0.8%
Raw Videos	VJEPa-H	72.44	77.03	97.67	66.66	85.79
Ours	VJEPa-H	51.42↓28.9%	76.62↓0.5%	97.54↓0.1%	66.30↓0.4%	84.81↓1.1%

Multi-Task Evaluation Trade-off Plots



Reconstruction Attack Resistance



References

- [1] Wu, Zhenyu, et al. "Privacy-preserving deep action recognition: An adversarial learning framework and a new dataset." IEEE Transactions on Pattern Analysis and Machine Intelligence 44.4 (2020): 2126-2139.
- [2] Bardes, Adrien, et al. "Revisiting feature prediction for learning visual representations from video." arXiv preprint arXiv:2404.08471 (2024).

https://joefioresi718.github.io/SPLAVU_webpage/

Webpage/Code:

