

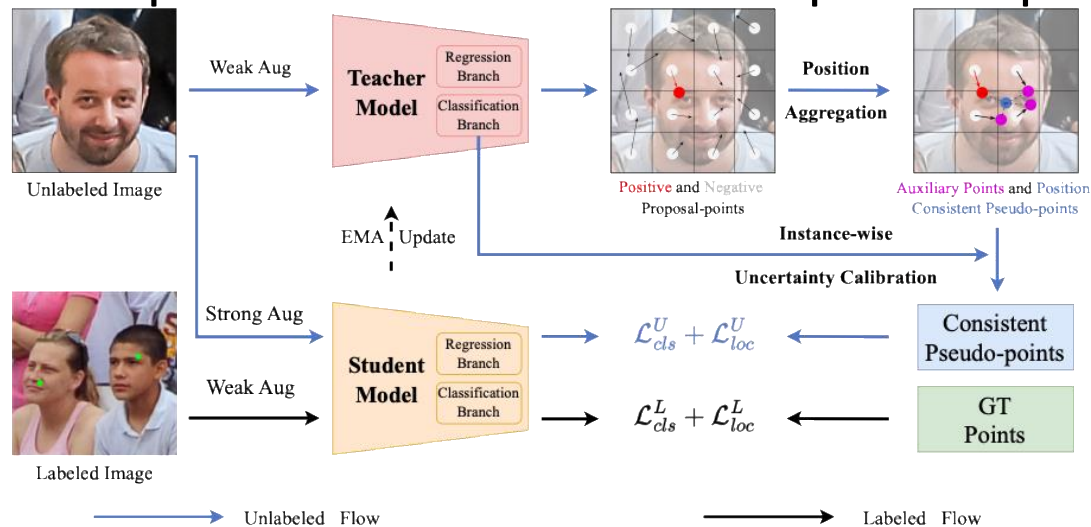
Consistent-Point: Consistent Pseudo-Points for Semi-Supervised Crowd Counting and Localization

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Problems & Ideas

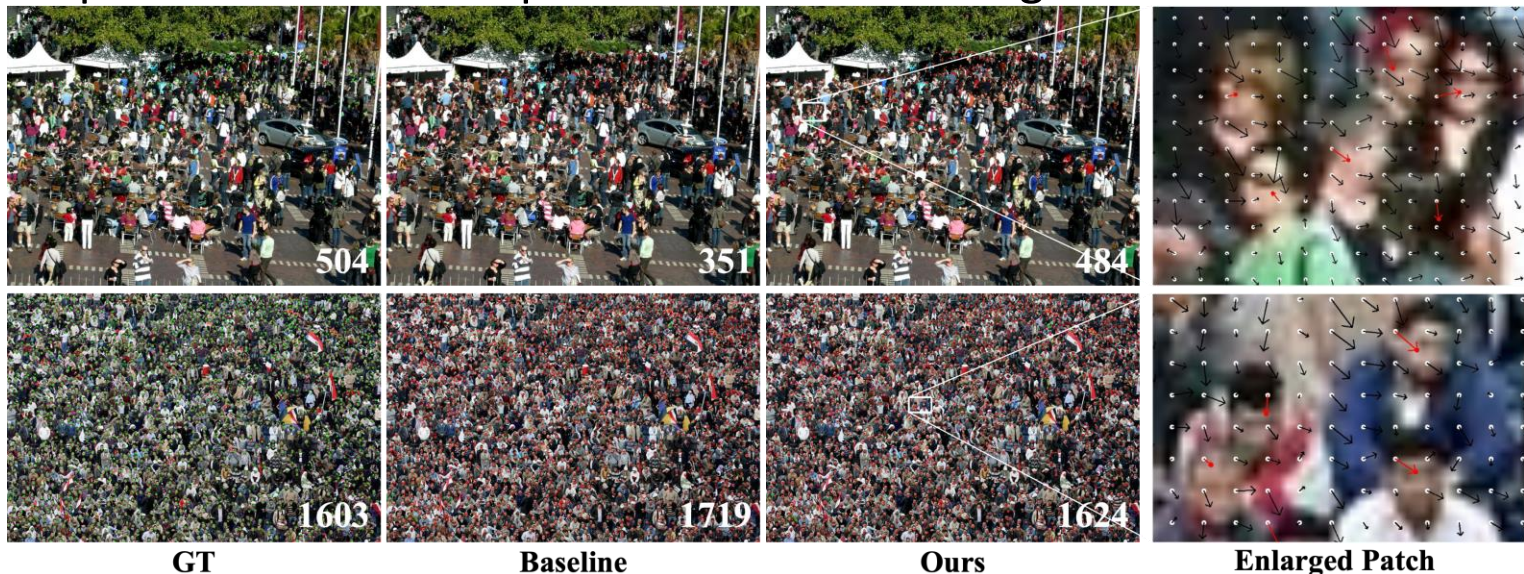
- Problems of conventional stereo matching approaches:
 - Semi-supervised localization-based crowd counting relies on teacher-generated pseudo-points, but **pseudo-points are inconsistent across training time**.
 - Two key issues: **position inconsistency** from the regression branch and **class inconsistency** from the classification branch in the teacher model.
- Ideas: PA aggregate positions of neighboring auxiliary proposal-points and IUC reweight pseudo-points by their cls confidence to produce more consistent pseudo-points.



Pipeline of Consistent-Point: PA aggregates neighboring proposal-points to stabilize pseudo-point positions, while IUC reweights pseudo-points by classification confidence to reduce ambiguity.

Main Contributions

- Contributions:
 - We analyze the inconsistency of pseudo-points for unlabeled images and propose a novel localization-based semi-supervised crowd counting method to improve their consistency effectively.
 - We propose two simple yet effective modules, PA and IUC, to improve the consistency of pseudo-point in terms of position and classification, respectively.
 - The proposed method achieves state-of-the-art crowd localization performance and impressive crowd counting results across 5 datasets.



Qualitative results: Consistent-Point produces more accurate point localization than the mean-teacher baseline (green: GT, red: predictions).