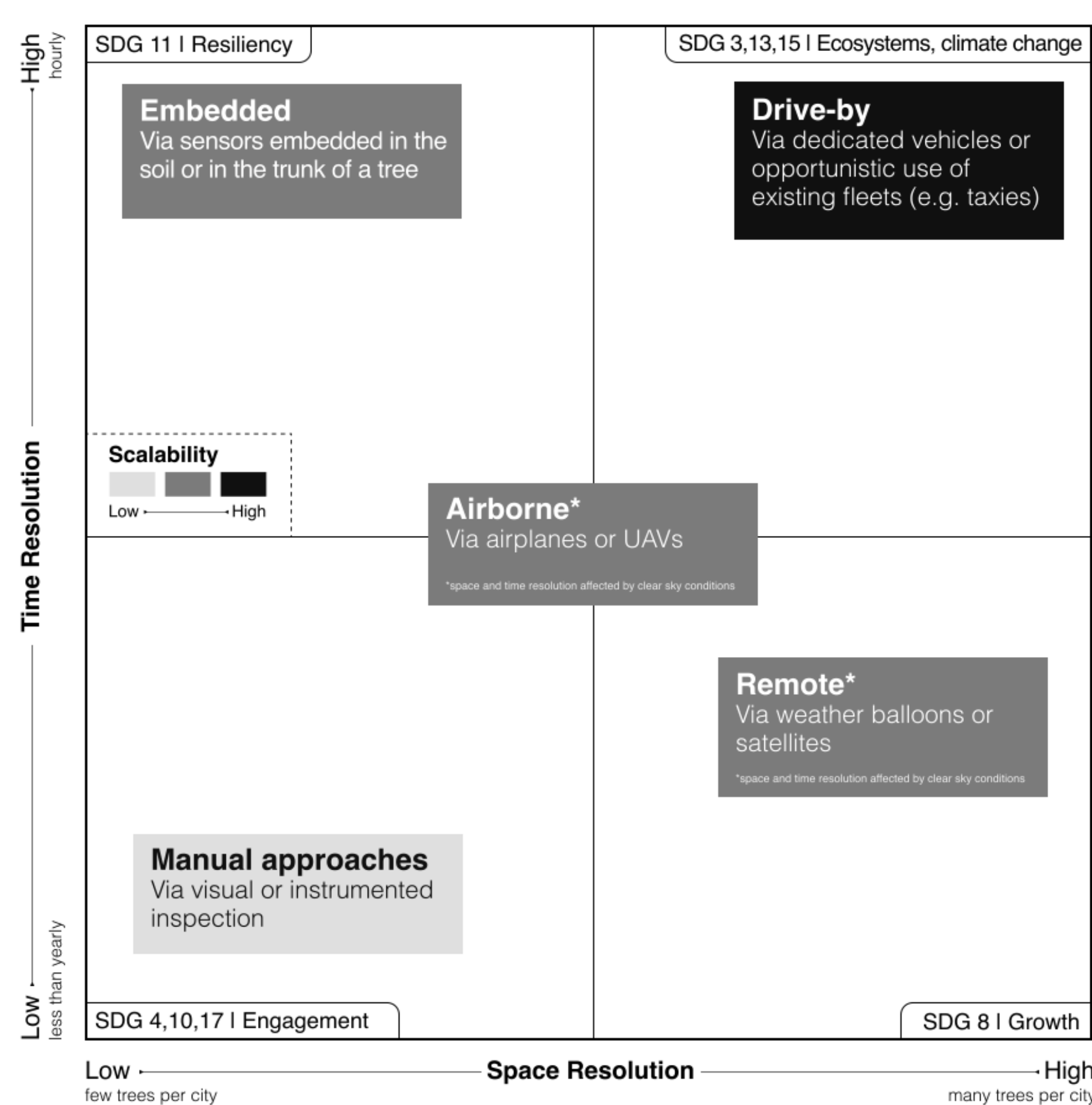


Street view imagery and computer vision facilitates efficient generation of urban environmental insights

Proposal Paper: Using street view imagery and deep generative modeling for estimating the health of urban forests

Ok, but why care about urban forests? multiple ecosystem benefits from regulating air temperatures, UHI, preventing surface run-off in events of rainfall, facing multiple stressors made worse with climate change.



Current methods for monitoring health of urban forests

- monitoring methods are non-automated, costly and subjective, leading to poor scalability
- tree health data has poor spatial and temporal resolutions
- Hence, delayed action due to infrequent assessments with temporal delay of two to four years.
- Recent methods based on mobile vehicular sensing utilize multiple imaging sensors leading to high operational costs.

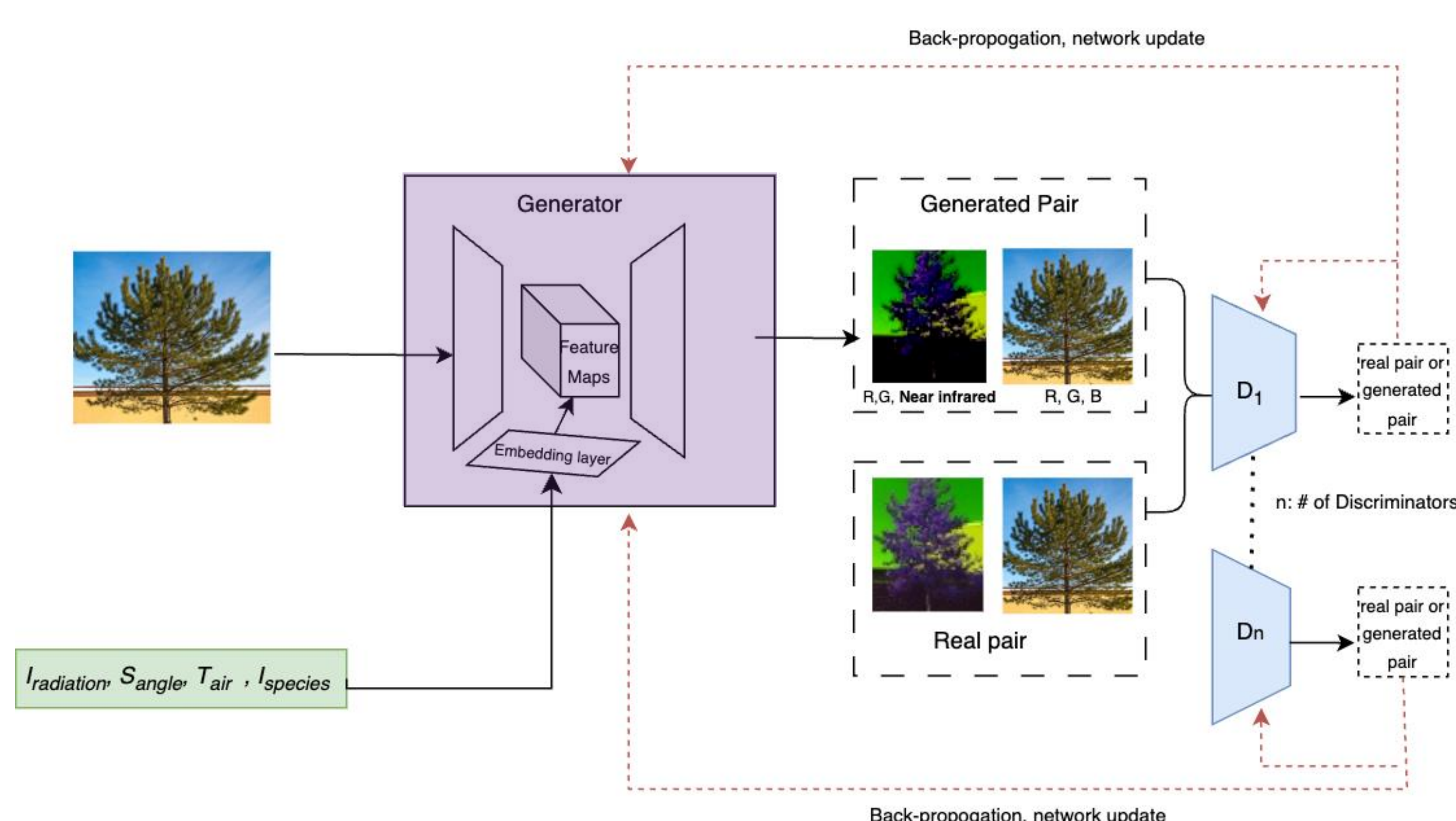
Methodology

Conditional GAN

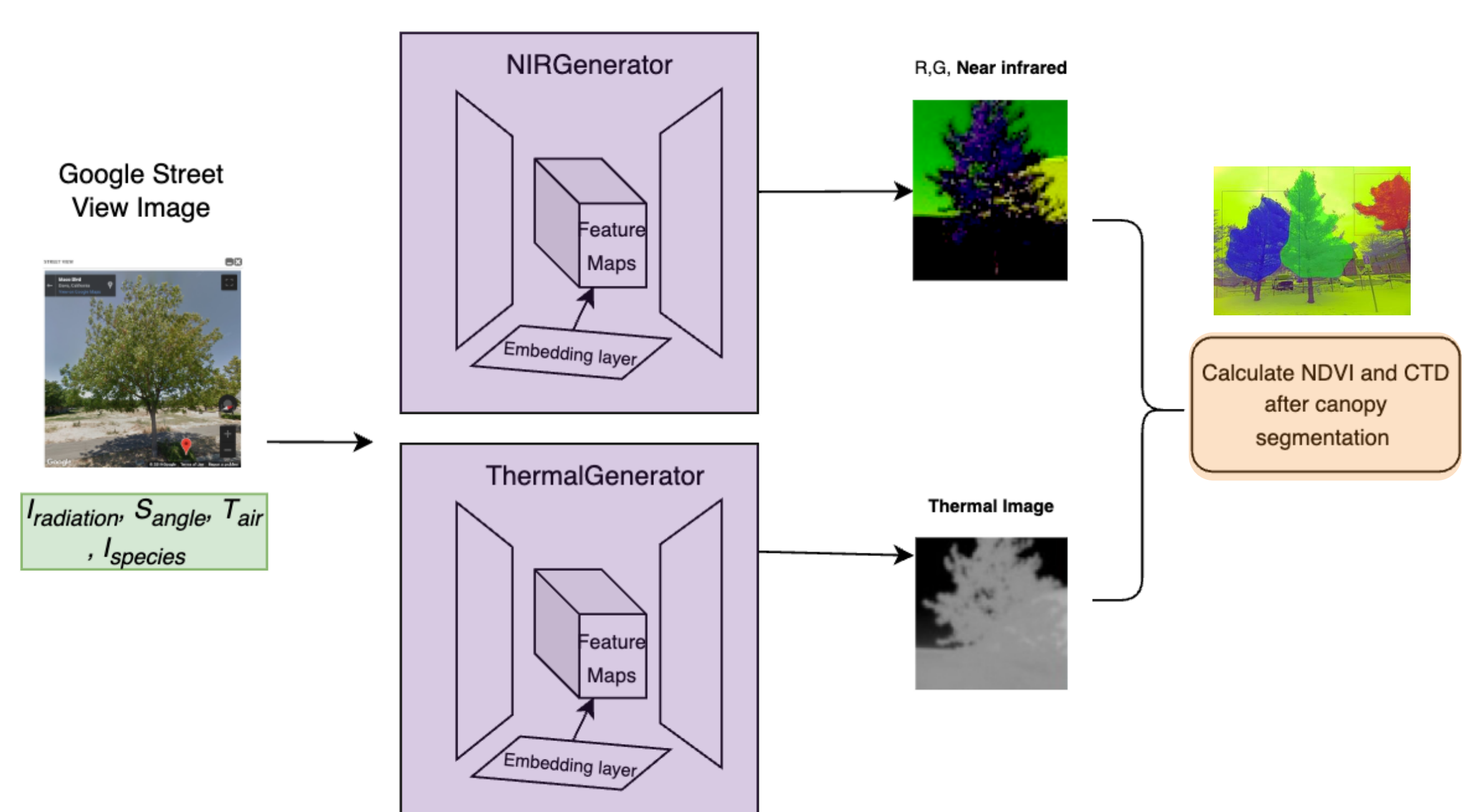
Instance Segmentation

Additional input data for application

1 Training image to image translation networks with added meteorological and phenological data

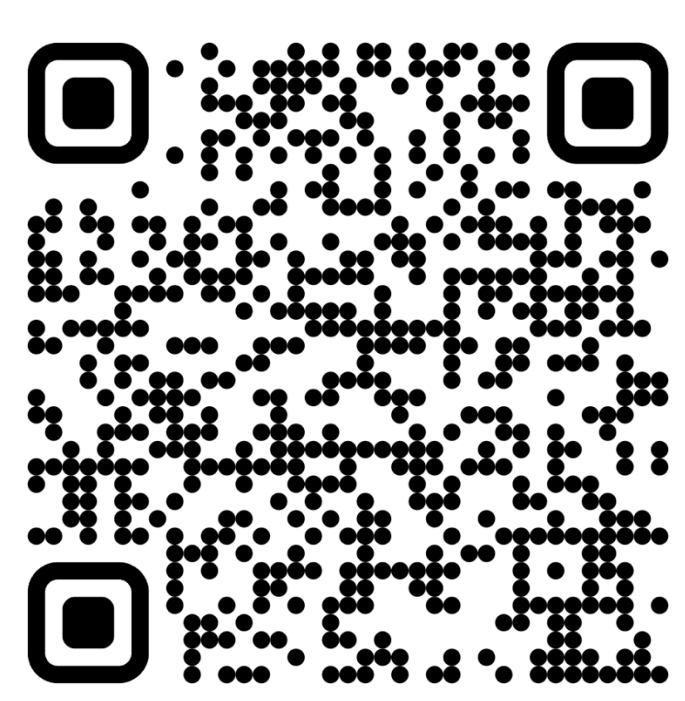


2 At inference, synthesize near-infrared and thermal channels from RGB street view imagery and estimate NDVI and CTD tree health parameters after segmentation



Data sources: Pairs of thermal, optical and near-infrared images : Gupta et. al. (2024) and Xu et. al. (2020)

$I_{radiation}, T_{air}, S_{angle}$: Meteorological data from weather services, $I_{species}$: Municipality inventory



Akshit Gupta, Remko Uijlenhoet
Reach out at a.gupta-5@tudelft.nl

