

AFN: Attentional Feedback Network based 3D Terrain Super-Resolution

Motivation

- ◆ Terrain represents features of an earth surface.
- ◆ High resolution terrain data coupled with Geographical Information Systems (GIS) extract topological information for various applications such as
 - Route planning, river/flood modelling,
 - Disaster mitigation planning,
 - Flight simulations,
 - Computer graphics-based games,
 - Entertainment and films...
- ◆ The terrains and their surface geology are digitally represented using Digital Elevation Models (DEM).
- ◆ We propose a novel fully convolutional neural network based super-resolution architecture to increase the resolution of low-resolution Digital Elevation Model (LRDEM) with the help of information extracted from the corresponding aerial image as a complementary modality.

Attentional Feedback Network Architecture

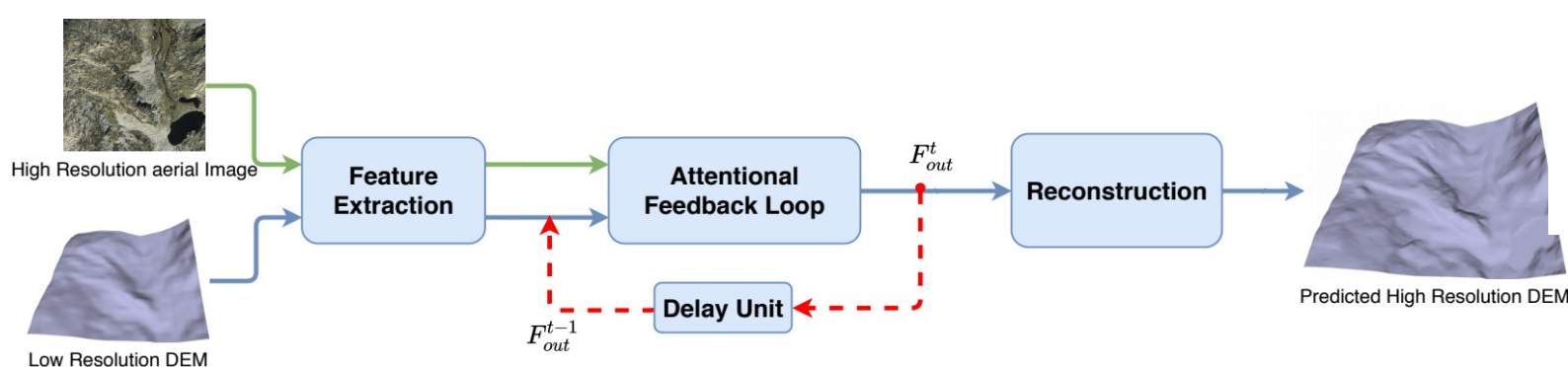


Fig. 1: Attentional Feedback Network Architecture

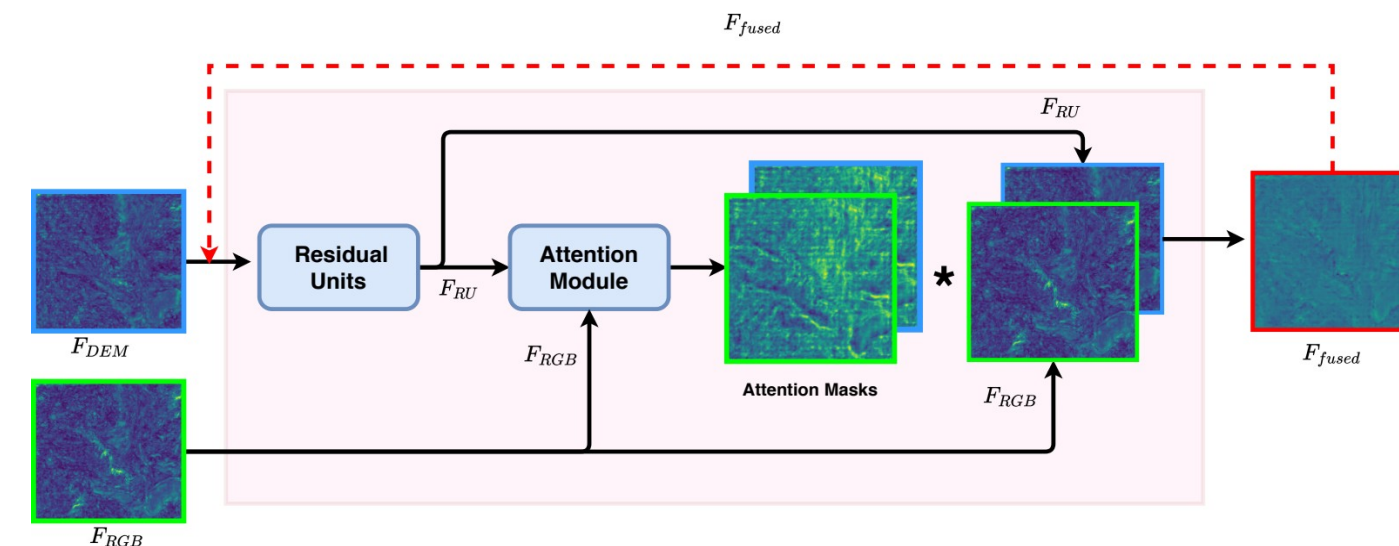


Fig. 2: Attentional Feedback Module

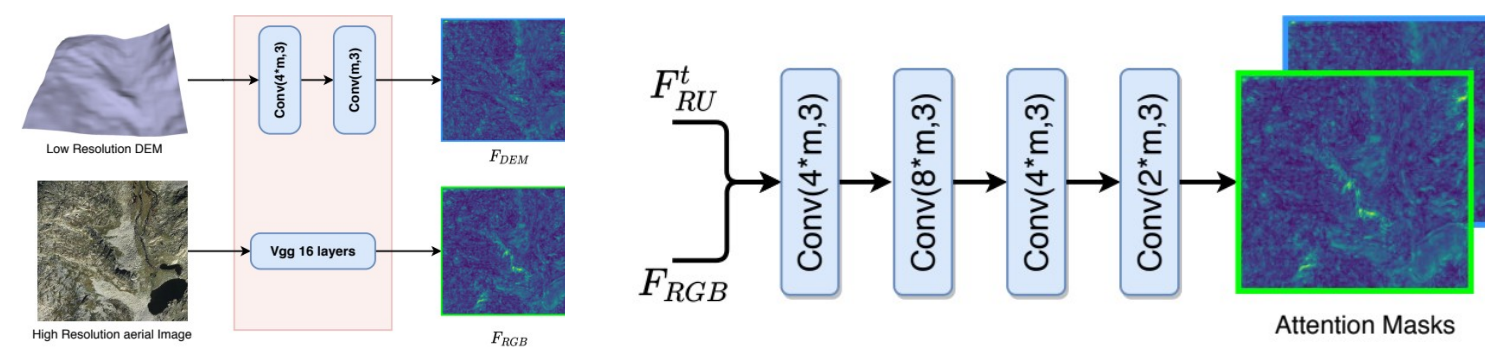


Fig. 3: Feature Extraction Module

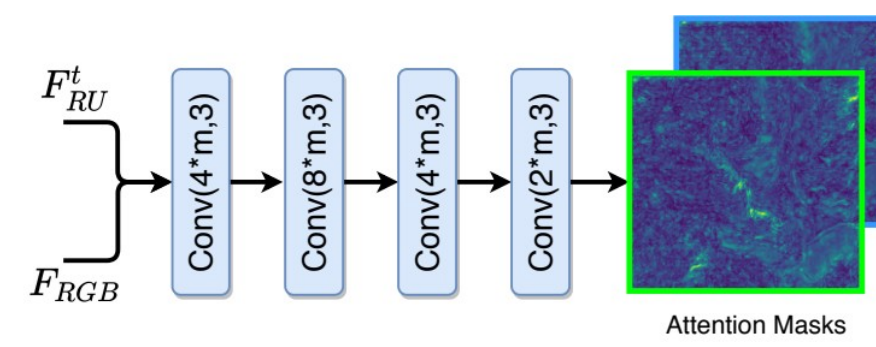


Fig. 4: Attention Module

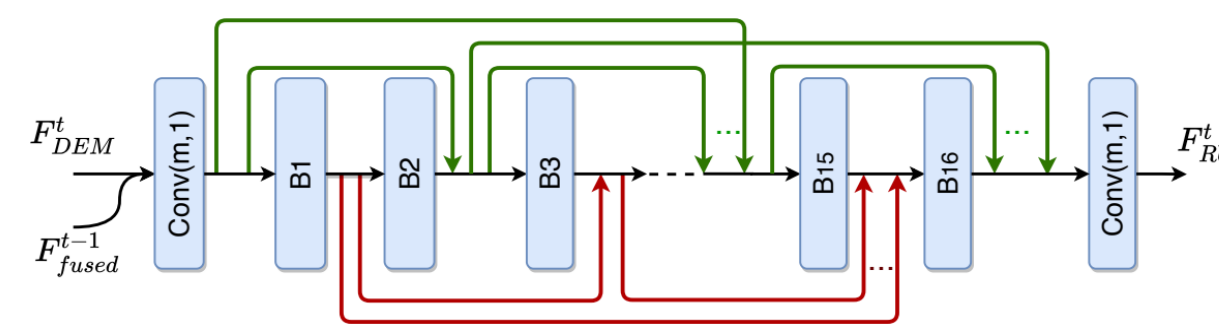
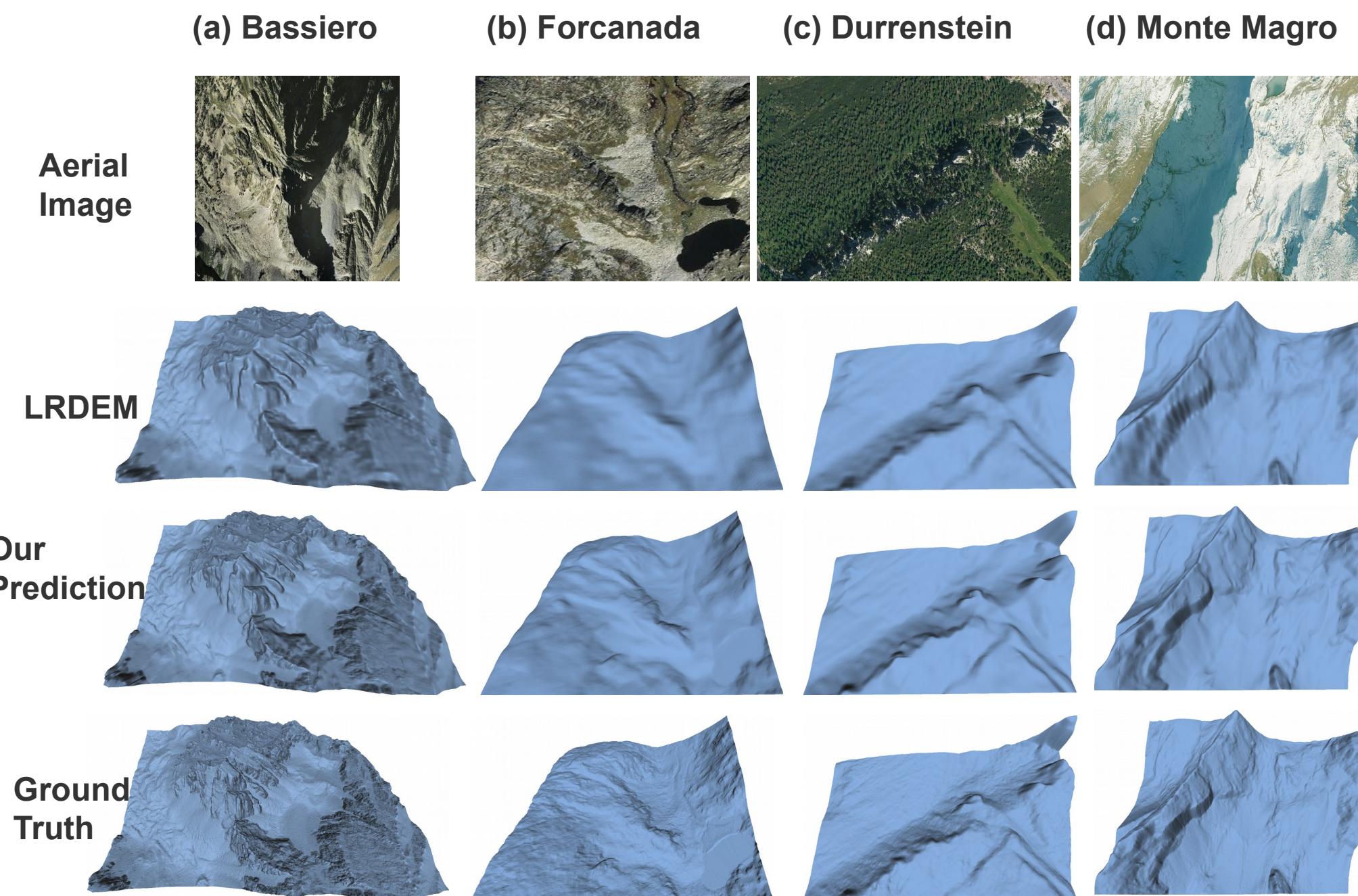


Fig. 5: Residual Module

Results



	Region	Bassiero	Forcanada	Durrenstein	Monte Magro
PSNR (↑)	Baseline	63.4	62.0	63.6	71.1
	Ours	63.958	62.351	63.841	71.211
RMSE (↓)	Baseline	1.005	1.097	0.901	0.587
	Ours	0.943	1.058	0.877	0.580