# **Bi-PointFlowNet**

8차 보고

### **Experiment** – WeightNet4( $c_{mid}$ =4, K=16)

#### **0. Cross Bi-directional Hint Loss**

Epoch: 350 EPE3D=0.0414 Feat1\_L1 Feat1\_L2 Feat1\_L3 Feat1\_L43 Feat1\_L32 Feat1\_L21 Feat1\_L10 Feat1 L1 Feat1 L2 Feat1 L3 Feat1\_L43 Feat1\_L32 Feat1\_L21 Feat1\_L10 ---UP&BFE&FP---------UP&BFE&FP----Hierarchical feature extraction Hierarchical feature extraction Multi Scale Loss Hierarchical feature extraction Hierarchical feature extraction **Ground Truth Data** Feat2 L1 Feat2 L2 Feat2 L3 Feat2 L43 Feat2 L32 Feat2 L21 Feat2 L10 Feat2\_L1 Feat2\_L3 Feat2\_L43 Feat2\_L43 Feat2\_L32 Feat2\_L21

Multi Scale Loss

Teacher Model Student Model





# **Experiment – WeightNet8** ( $c_{mid}$ =8, K=16)

	Baseline	Weightnet=8		
FLOPs	13.3G	9.36G(30%↓)		
Param	7.98M	4.47M(43%↓)		

#### **Baseline**

Dataset	EPE3D(↓)	ACC3DS(↑)	ACC3DR(†)	Outliers3D(↓)	EPE2D(↓)	ACC2D(↑)
FlyingThings	0.0288m	0.918	0.978	0.143	1.582	0.930
KITTI	0.0302m	0.920	0.962	0.136	1.061	0.948

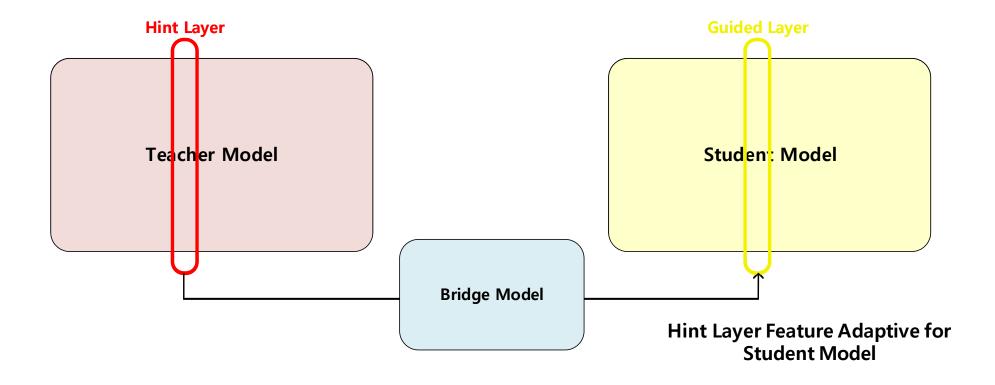
#### WeightNet8( $C_{mid}$ =8, K=16)

Loss Function	Dataset	EPE3D(↓)	ACC3DS(↑)	ACC3DR(†)	Outliers3D(↓)	EPE2D(↓)	ACC2D(↑)
Scratch FlyingThings KITTI	FlyingThings	0.0287m(0.0280)	0.921(0.923)	0.979(0.979)	0.139(0.137)	1.606	0.931
	0.0284m(0.0294)	0.926(0.927)	0.968(0.962)	0.132(0.136)	1.026	0.952	
Bi-Directional Hint Training Loss	FlyingThings	0.0282m	0.924	0.980	0.136	1.642	0.934
	KITTI	0.0292m	0.923	0.961	0.138	0.972	0.953
Bi-Directional Hint Training Loss + Scratch	FlyingThings	0.0266m	0.932	0.982	0.129	1.492	0.941
	KITTI	0.0286m	0.930	0.965	0.134	1.002	0.954





# **Bridge KD Hint Training - Overview**

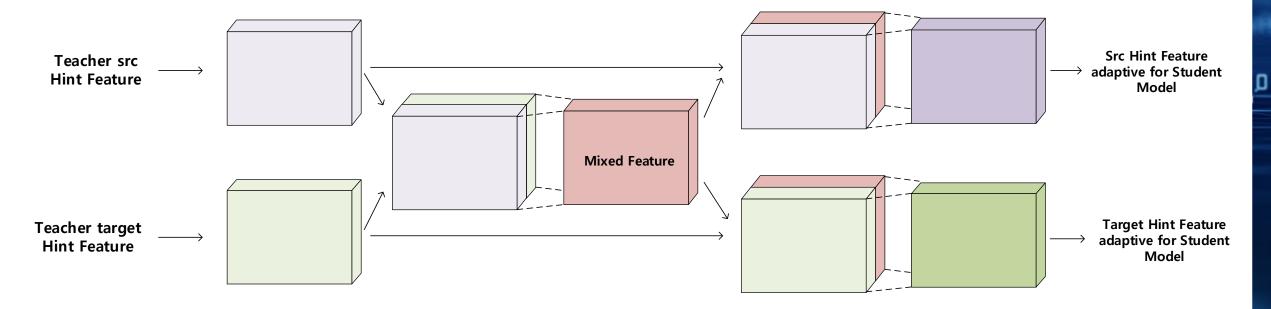






# Bridge KD Hint Training - Bridge Model

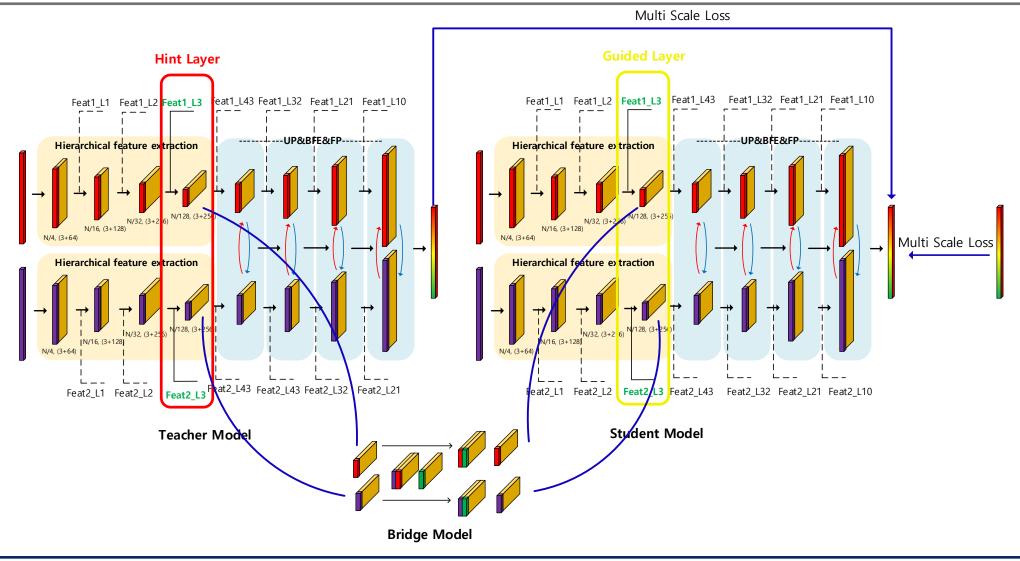
#### **Bridge Model**







# **Bridge KD Hint Training - Architecture**







# **Experiment** – WeightNet4 ( $c_{mid}$ =4, K=16)

	Baseline	Weightnet=4
FLOPs	13.3G	7.37G(45%↓)
Param	7.98M	2.73M(66%↓)

#### **Baseline**

Dataset	EPE3D(↓)	ACC3DS(↑)	ACC3DR(†)	Outliers3D(↓)	EPE2D(↓)	ACC2D(†)
FlyingThings	0.0288m	0.918	0.978	0.143	1.582	0.930
KITTI	0.0302m	0.920	0.962	0.136	1.061	0.948

#### WeightNet4( $C_{mid}$ =4, K=16)

Loss Function	Dataset	EPE3D(↓)	ACC3DS(↑)	ACC3DR(↑)	Outliers3D(↓)	EPE2D(↓)	ACC2D(†)
Constale	FlyingThings	0.0325m	0.902	0.974	0.163	1.833	0.915
Scratch	KITTI	0.0319m	0.923	0.964	0.140	1.118	0.949
Hint Training Loss	FlyingThings	0.0317m	0.905	0.975	0.159	1.755	0.917
Hint Training Loss	KITTI	0.0325m	0.929	0.961	0.137	1.136	0.946
Bi-Directional Hint Training Loss	FlyingThings	0.0305m	0.910	0.977	0.155	1.667	0.923
	KITTI	0.0360m	0.906	0.951	0.151	1.219	0.935
Bridge KD Hint Training Loss	FlyingThings	0.0306m	0.910	0.977	0.153	1.675	0.925
	KITTI	0.0350m	0.908	0.957	0.146	1.237	0.936



