Supplementary Material
UFO: Unified Feature Optimization

Teng Xi⋆, Yifan Sun⋆, Deli Yu⋆, Bi Li⋆, Nan Peng⋆, Gang Zhang⋆⋆,
Xinyu Zhang, Zhigang Wang, Jinwen Chen, Jian Wang, Lufei Liu,
Haocheng Feng, Junyu Han, Jingtuo Liu, Errui Ding, and Jingdong Wang

Baidu Inc.
Code: https://github.com/PaddlePaddle/VIMER/tree/main/UFO

1 Multi-task NAS benchmark

The sampled sub networks in UFO are released as one of the first multi-task NAS benchmark and has supported the performance prediction track of the second lightweight NAS challenge of CVPR 2022 (https://cvpr-nas.com/competition). The Multi-task NAS benchmark is released in Baidu AI Studio which is a one-stop developer platform based on Baidu's deep learning platform PaddlePaddle. Baidu AI Studio provides free online courses, free computing power support and non-stop competitions to encourage the development of deep learning.

2 More Experiments

UFO also utilized bigger backbone and more dataset and released the VIMER-UFO, a task-MoE based 17 billion parameters computer vision foundation model, which supports extraction of lightweight models by sparse activation and achieves SOTA on 28 datasets across a battery of visual recognition tasks.
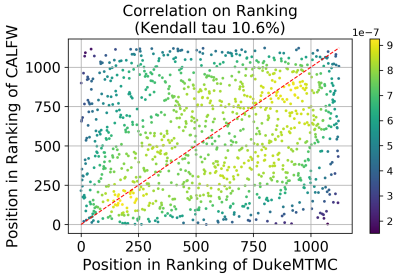
3 All cross tasks correlations

In this section, we will show all cross tasks correlations. As shown in figure 1, 2 and 3, the benchmark of face is sightly correlated to all other tasks. While, certain benchmarks of person, vehicle and products are highly correlated.

## 4 The performances of task specific predictors

Figure 4, illustrate the performances of the task specific predictors. We measure the correlation between the predicted rankings and ground truth rankings of selected benchmarks. As shown in the figure, the predictors all have very good accuracy except for CPLFW.
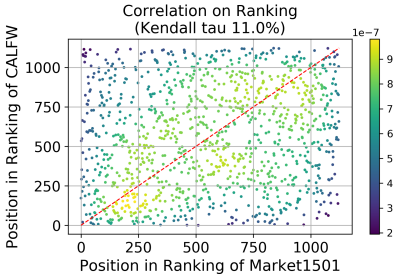

⋆ Equal contribution
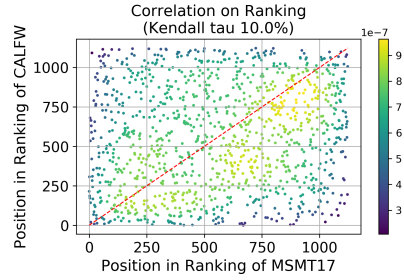⋆⋆ Corresponding to {zhanggang03,xiteng01}@baidu.com
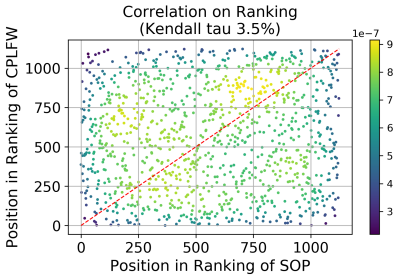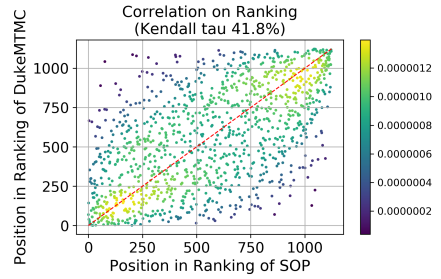
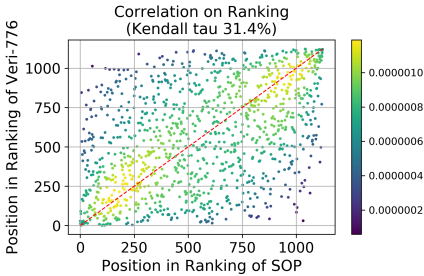(a) Face and Person
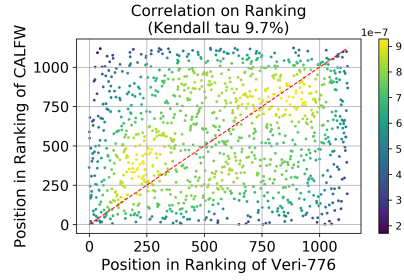
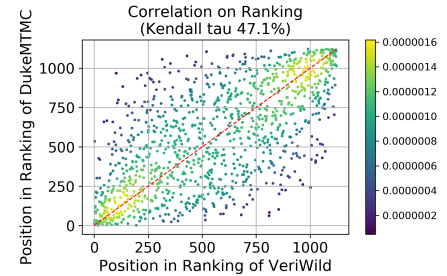(b) Face and Vehicle

(c) Face and Person

(d) Face and Person

(e) Face and Products

(f) Person and Products

(g) Vechicle and Products

(h) Person and Vehicle

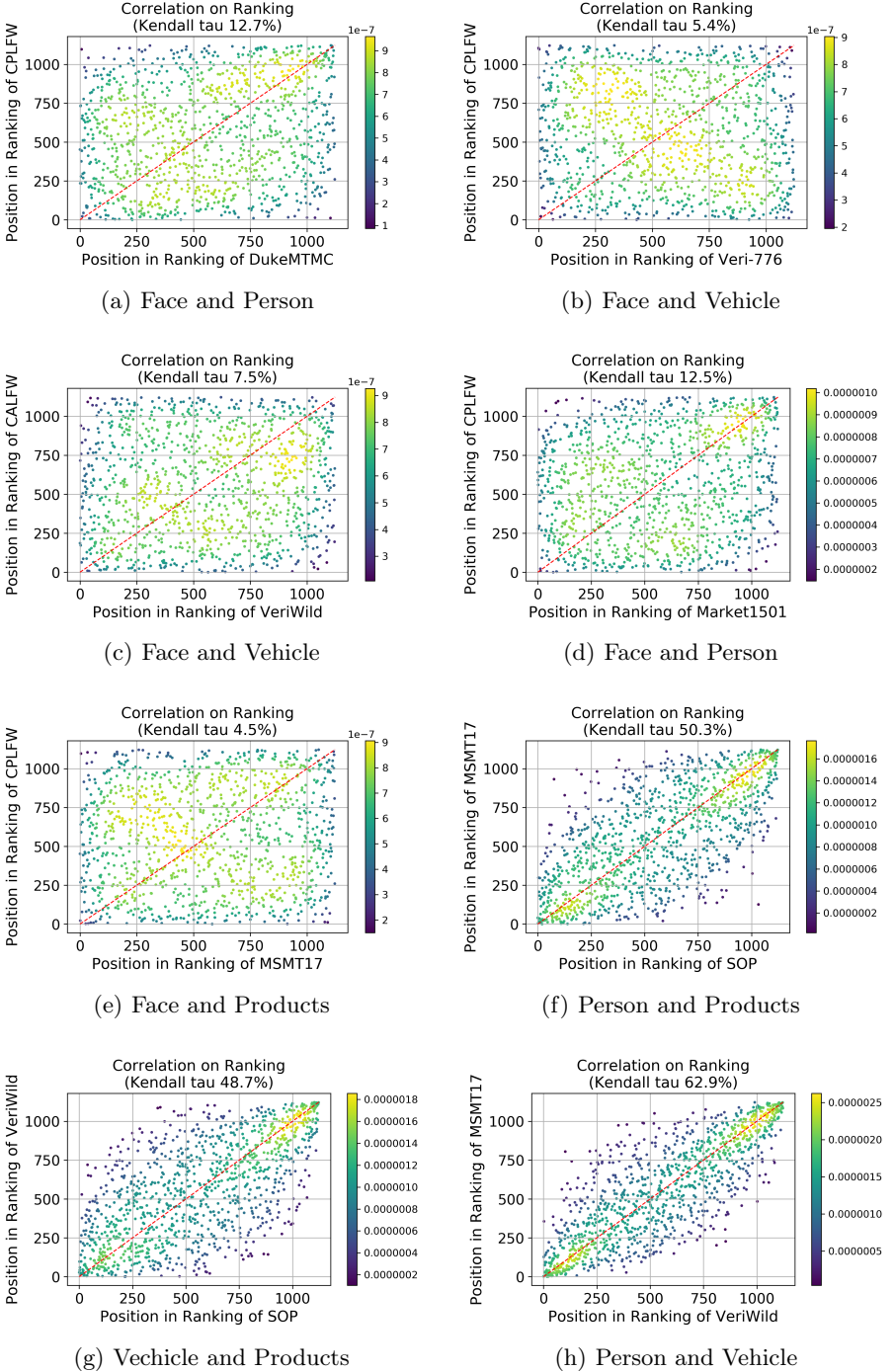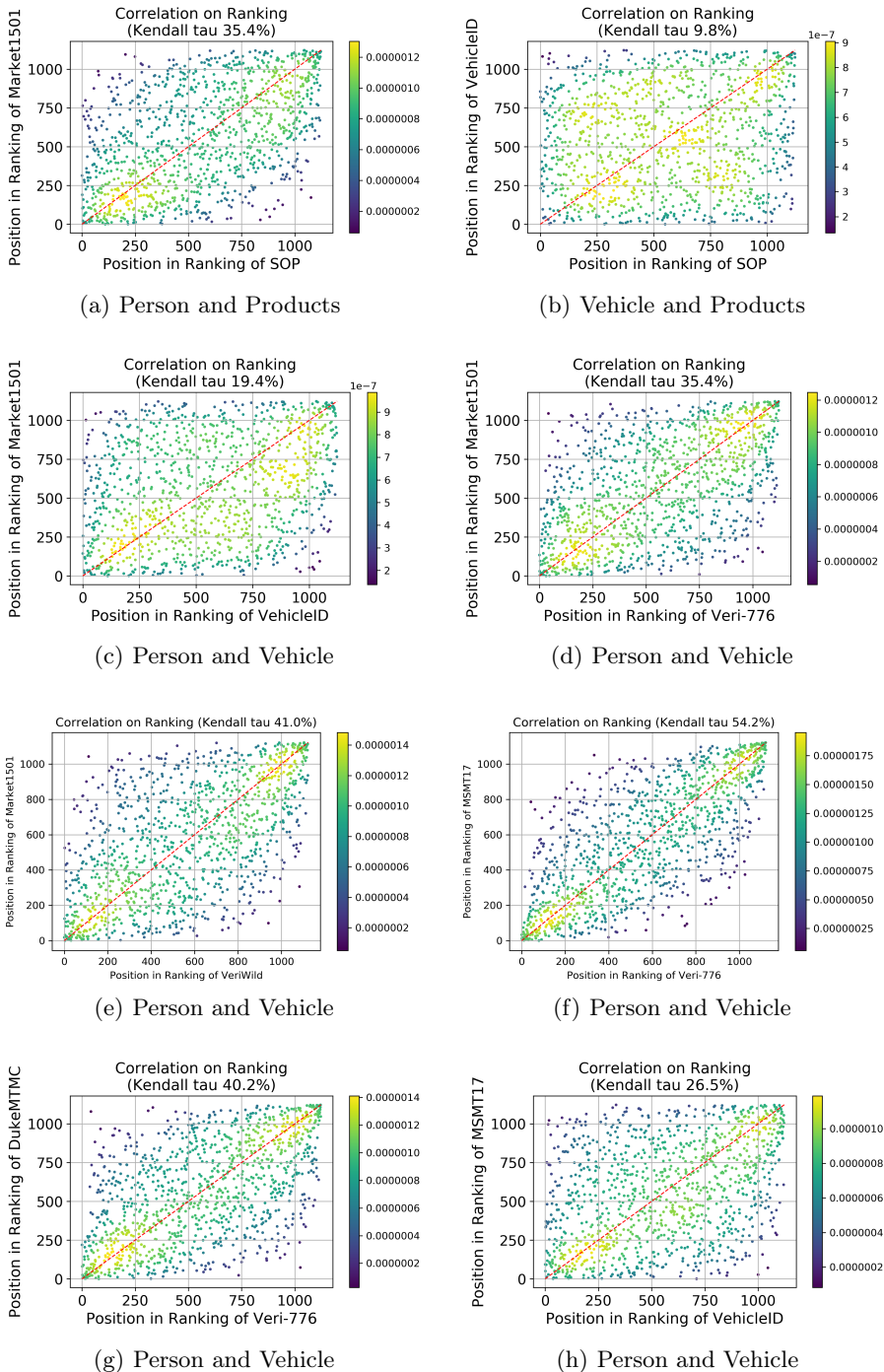**Fig. 1.** All cross tasks correlations part one.

(a) Face and Person

(b) Face and Vehicle

(c) Face and Vehicle

(d) Face and Person

(e) Face and Products

(f) Person and Products

(g) Vechicle and Products

(h) Person and Vehicle

Fig. 2. All cross tasks correlations part two.

(a) Person and Products

(b) Vehicle and Products

(c) Person and Vehicle

(d) Person and Vehicle

(e) Person and Vehicle

(f) Person and Vehicle
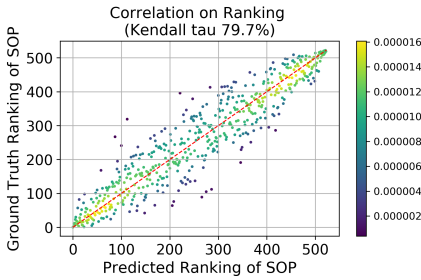
(g) Person and Vehicle

(h) Person and Vehicle

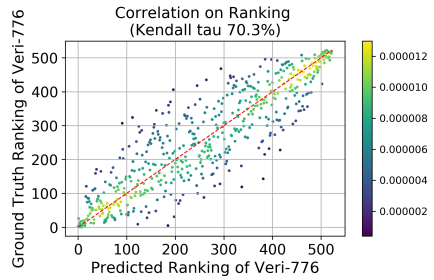**Fig. 3.** All cross tasks correlations part three.
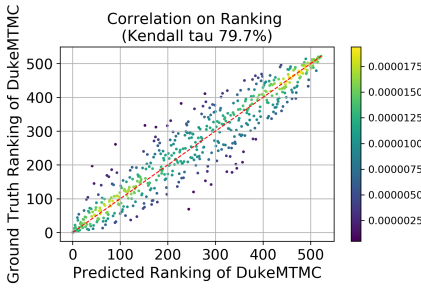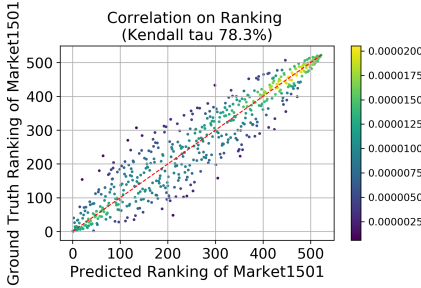
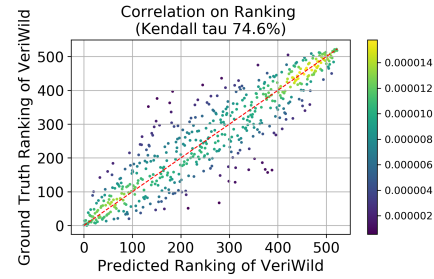(a) Predictions on MTMC.
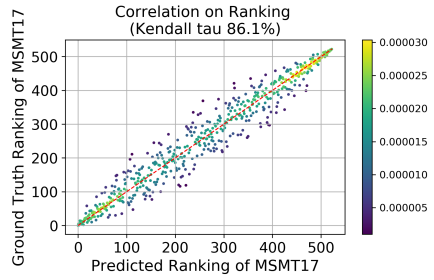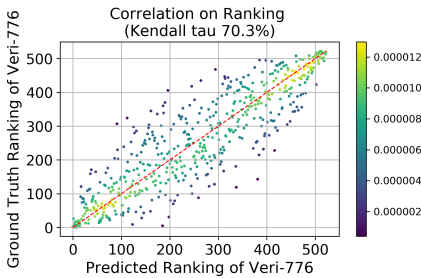
(b) Predictions on MSMT17.
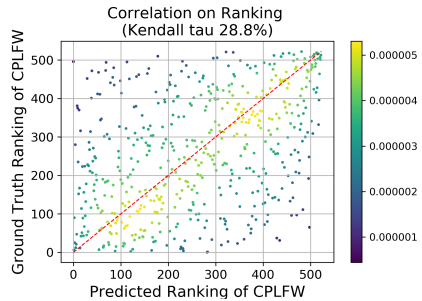
(c) Predictions on SOP.

(d) Predictions on Veri-776.

(e) Predictions on Market1501.

(f) Predictions on VeriWild.

(g) Predictions on VehicleID.

(h) Predictions on CPLFW.

Fig. 4. Performance of task specific predictors on more benchmarks.