Problem Statement:

Our problem itself is a segmentation problem, that is, classifying each pixel

But in general, deep learning requires complete segmentation mask during training

Mask *VS.* **Points**
(Very limited info)

And our annotation is based on points, or incomplete tagging, which is not a common deep learning situation, and it's a very challenging problem

To overcome this challenge of limited point annotation information, we developed a custom deep learning framework for the landvisor project, which consists of:

- The baseline is guaranteed by using transfer learning and pre-training models based on large amounts of data

- A special loss function (called partial CE loss) is designed so that point labeling can be used to train the segmentation model

$$pfCE = \frac{\sum(Focal\,loss(pre, GT) \times MASK_{labeled})}{\sum MASK_{labeled}}$$

- Semi-supervised technology is used to make full use of unmarked pixels to further improve model performance

- Use amplification when testing to improve performance
- Use ensemble learning to integrate multiple deep learning models to further improve performance
- Referring to the original ML pipeline, histogram matching is used to ensure the stability of the picture style

Task:

1. Implement partial Cross entropy loss
2. Find any remote sensing image segmentation data, randomly sample the simulated point label, andadd the loss to any remote sensing segmentation network
3. Design experiments, explore one or two factors that affect the performance, and write technical reports (method + experiment(purpose/hypothesis + experimental process + results))

Tools:

You may use any deep learning toolbox to solve the task but must use Python as the programming language. You can

send me task in the form of a python file or a Jupyter notebook along with the supporting document.