

NegSelReport

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Two-letter code for your chosen negative selection algorithm: VD

The parameters are num_detectors = 500, c_0 = 0.99, c_1 = 0.99, n = 2 and threshold(radius of Self) = 0.0015.

During optimizing the parameters, I set the number of required detectors 500. If the number of detectors in the detector set is higher, the false alarm rate will be higher. I tested the results by comparing 500 and 1000. Even though the detection rate with 1000 is higher by around 2 to 3 percent, the false alarm rate is above 20 percent while the false alarm rate with 500 is around 15 percent, which is more than the improvements of detection rate by making t_0 and t_1 not achieving the limitation too soon.

I also set both c_0 and c_1 to 0.99. As long as a potential detector overlap with other detectors and is not far from Self enough, that potential detector will not be added to the detector set. With larger c_0 and c_1, more potential detectors are checked.

The number of the detectors set highly depends on the number of the radius of Self. The higher the radius of Self is, the less the size of the detector set. Therefore, I set the radius of Self to 0.0015, making the generated detector set size nearly 500, as I set the required number of detectors 500.

In addition, I tried to do an enhancement but failed, so the implementation submitted is the vanilla version. Even though the experiment failed, I still describe it just in case you are interested in the experiment I did.

The experiment was done to solve the problem resulting from the radius of Self being too small. During the training process, a potential detector might go into some holes in the Self of the training set due to the small radius of the Self and sparsity of the training set.

Therefore, before a detector is added to the detector set, the radius of the potential detector is increased to check whether that larger detector touches more Selves or detectors. If the number of detectors touched is more than the number of Selves touched, that detector can be concluded to be inside the non-Self. On the other hand, if the number of Selves touched is more than the number of detectors touched. With this approach, whether a potential detector is in Self is identified.

However, I find it hard to find how much the radius of the detector should be increased. Whenever I tried to set the number, this enhancement did not work in different parameters.