

BoundaryCheck implementation

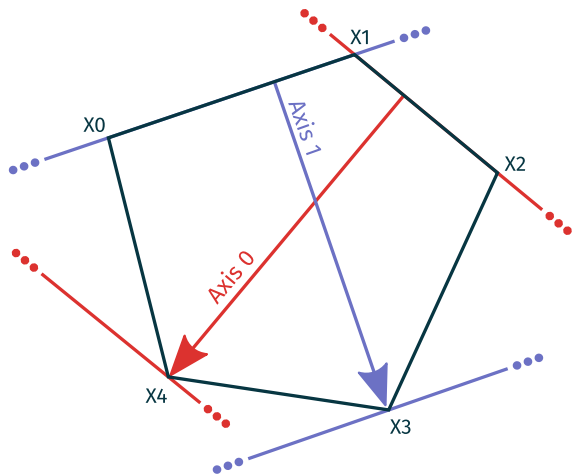
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What it currently does

1

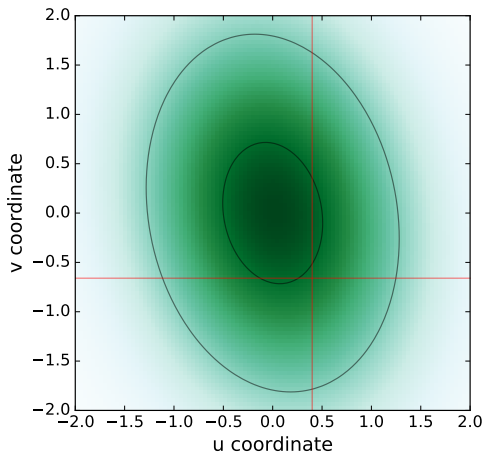


- Define axes
- Build k-dimensional discrete oriented polytope (kDOP)
- Check overlap along the same axis
- Covariance translated into kDOP

Covariance weighted distance

2

Also known as Mahalanobis distance



Weight distance with inverse covariance

$$\begin{aligned}d^2 &= \vec{a}^T \Sigma^{-1} \vec{a} \\ &= (u \ v) \Sigma^{-1} \begin{pmatrix} u \\ v \end{pmatrix}\end{aligned}$$

In 2d: d^2 is χ_2^2 distributed.

Use fixed sized polytopes. Replace

```
1      using KDOP = std::vector<Vector2 >;
```

with

```
1      template <int n> BoundaryAxes;  
2      template <int n> BoundaryLimits;
```

How to handle weighted distance? To closest point? Along each axis?