COMP0120 PROJECT - SUPPORT VECTOR MACHINES (SVMs)

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1. Mathematical Setting - Summary

1.1. **Binary Classification.**

Primal Problem
Dual Problem

1.2. **Hard Margin.**

1.3. **Soft Margin.**

1.4. **Challenge!**

More classes?
Different Penalty Functions?
Algorithms not on syllabus?

1.5. **Non-Linear Classification.**

Kernels?

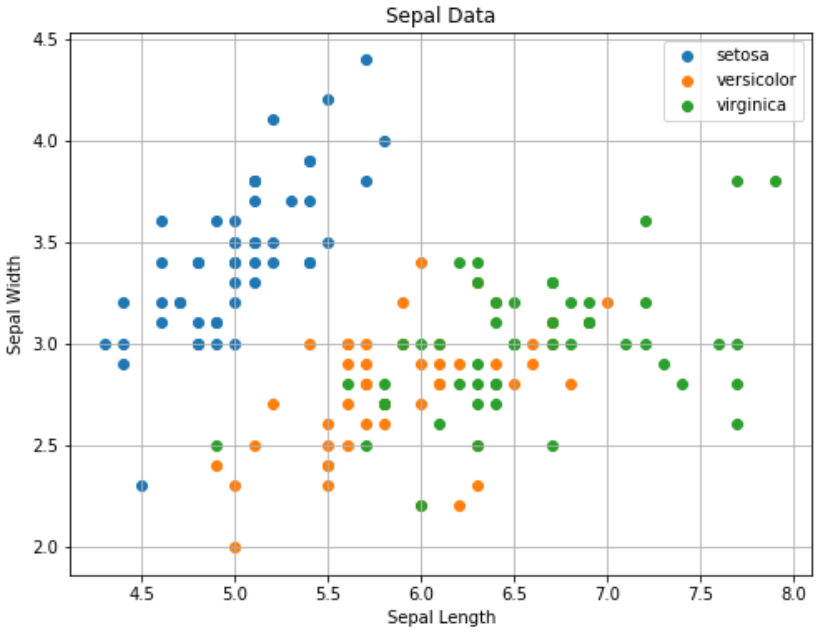

Figure 1. Iris Dataset Sepal Data

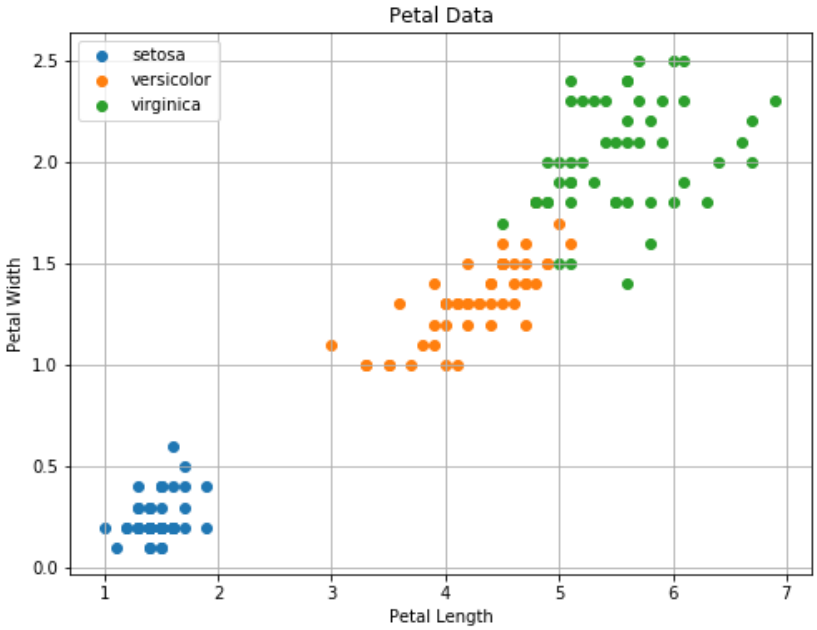

FIGURE 2. Iris Dataset Petal Data

2. Simulation Study

2.1. **Chosen Data Set.**

Challenges?
How to address?

2.2. **Resulting Optimisation Problem.**

Convex/Non-Convex
Constrained/Unconstrained
Smooth/Non-Smooth
Linear/Quadratic/Non-Linear
Challenges

3. Solution of Optimisation Problem

3.1. **Algorithm 1.**

3.2. **Algorithm 2.**

4. References

[1] ???
[2] ???
[3] ???
[4] Scikit-learn: Machine Learning in Python, Pedregosa et al., JMLR 12, pp. 2825-2830, 2011.