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Simulating Crowds in Real-Time with Agent-Based Modelling and a Particle Filter

Dr. Kevin Minors

GISRUK 2019

LEEDS *Institute for
Data Analytics*

Motivation



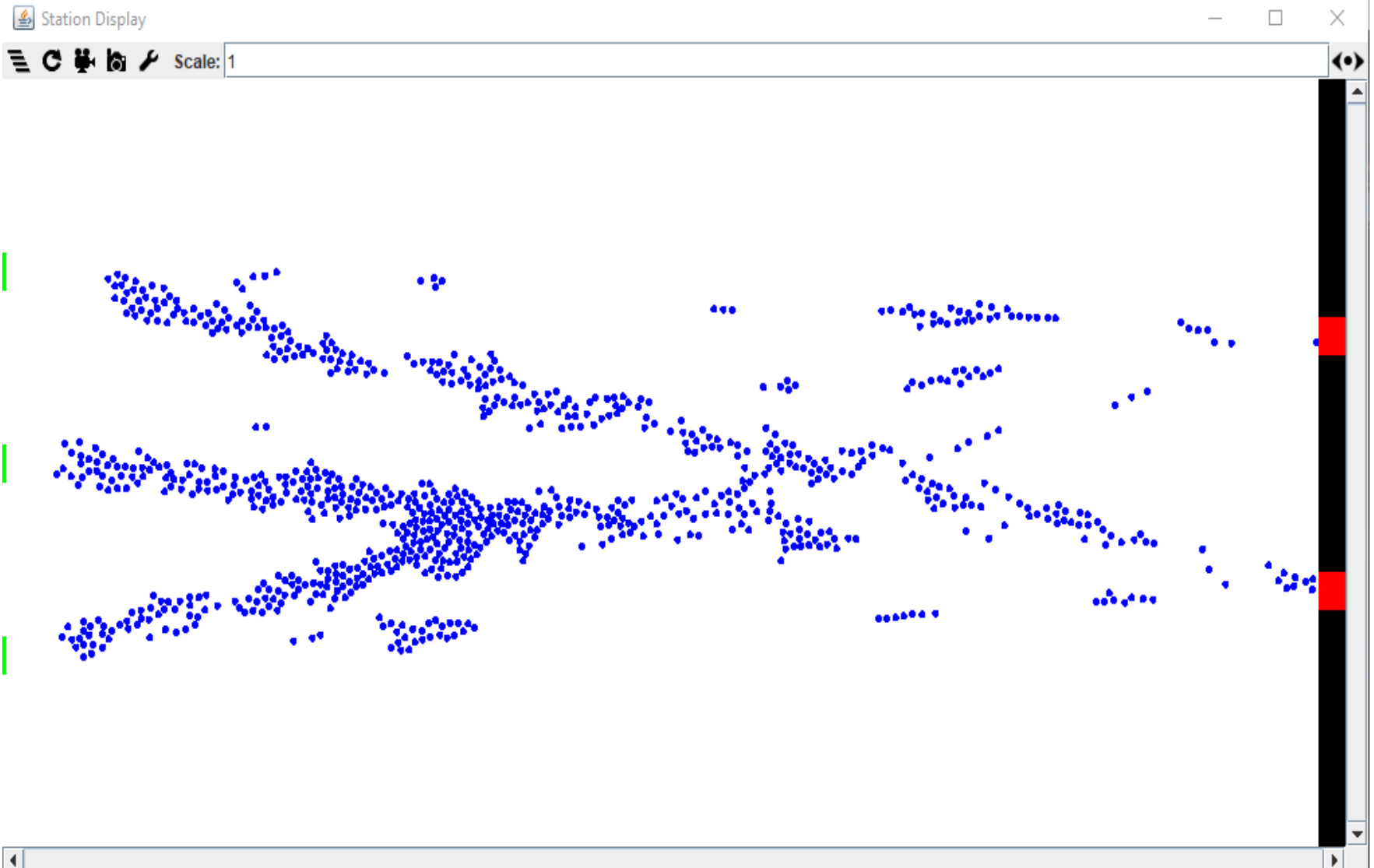
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Motivation



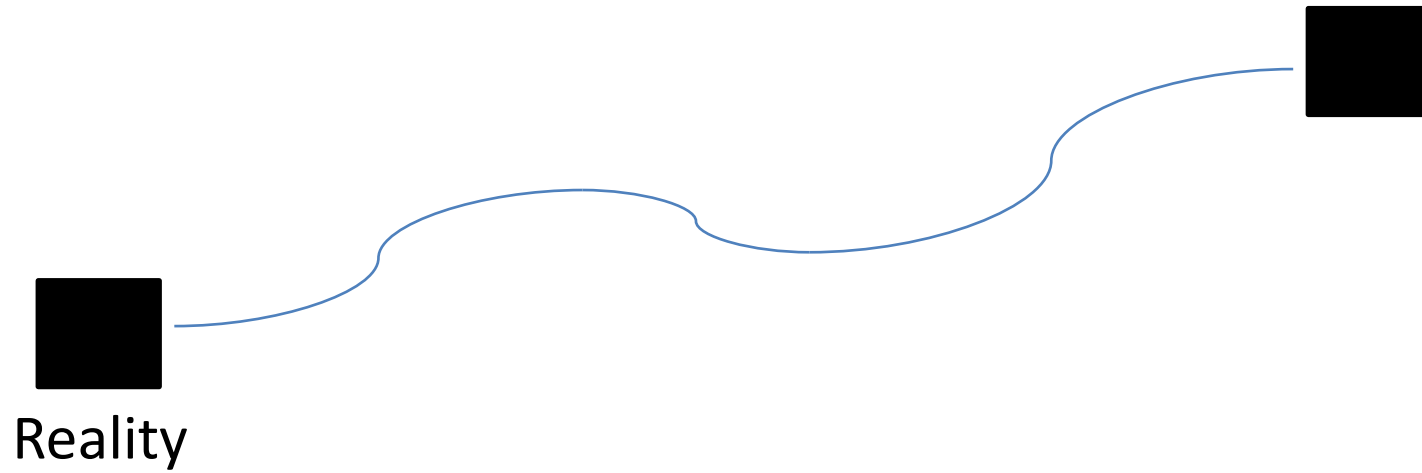
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The Problem



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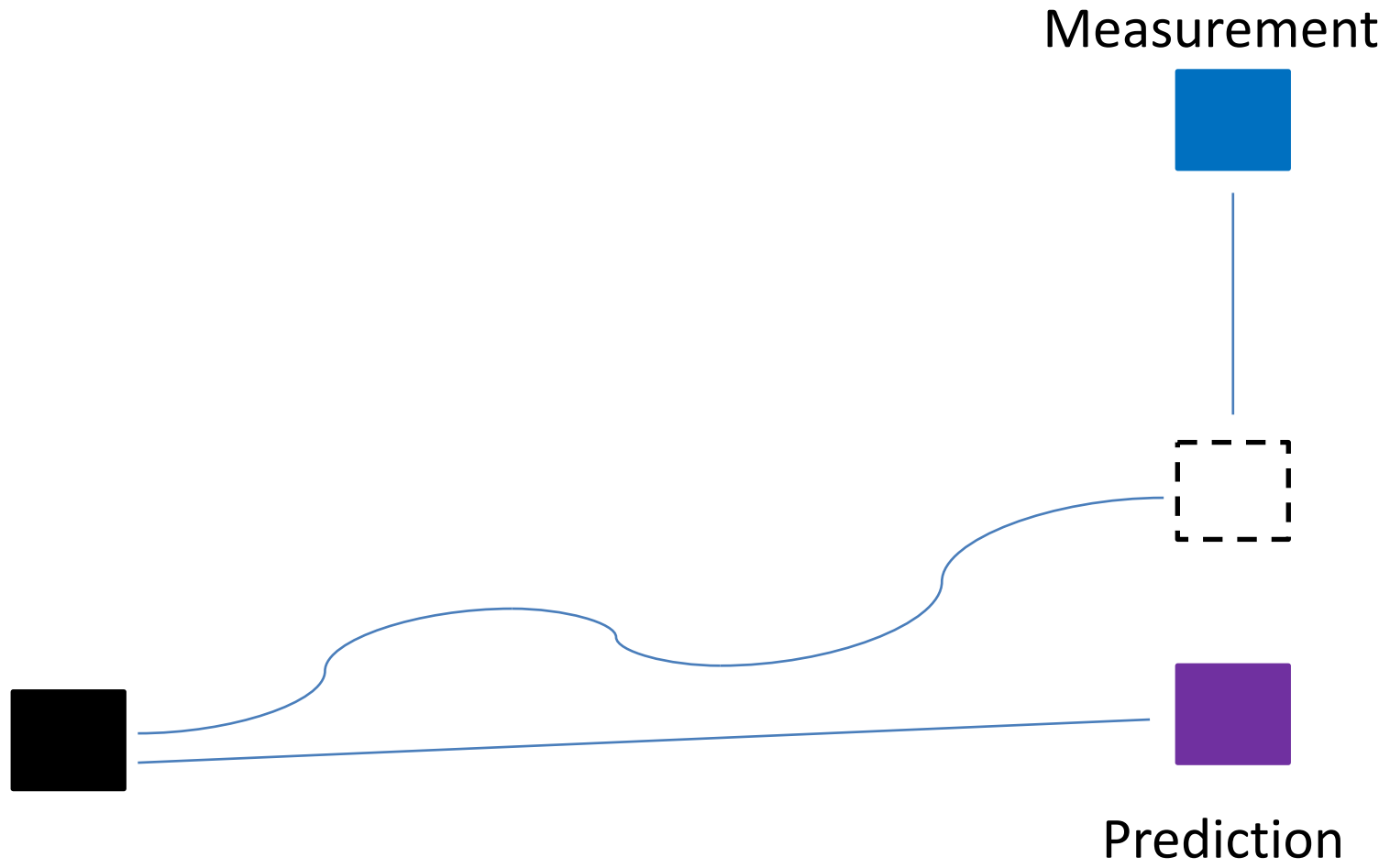
Reality

Time

The Problem



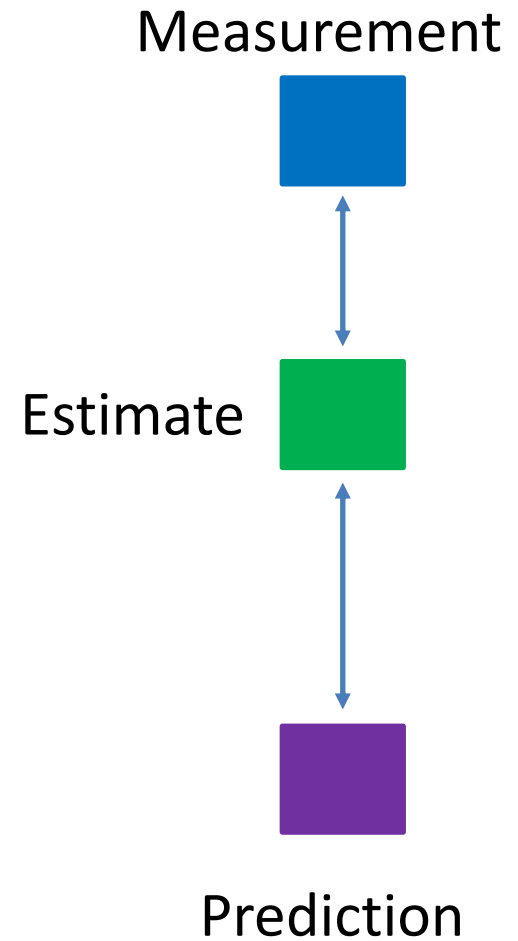
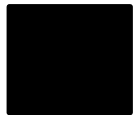
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The Problem



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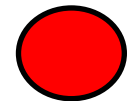
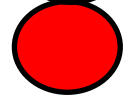
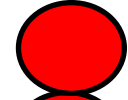
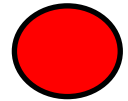
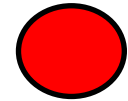
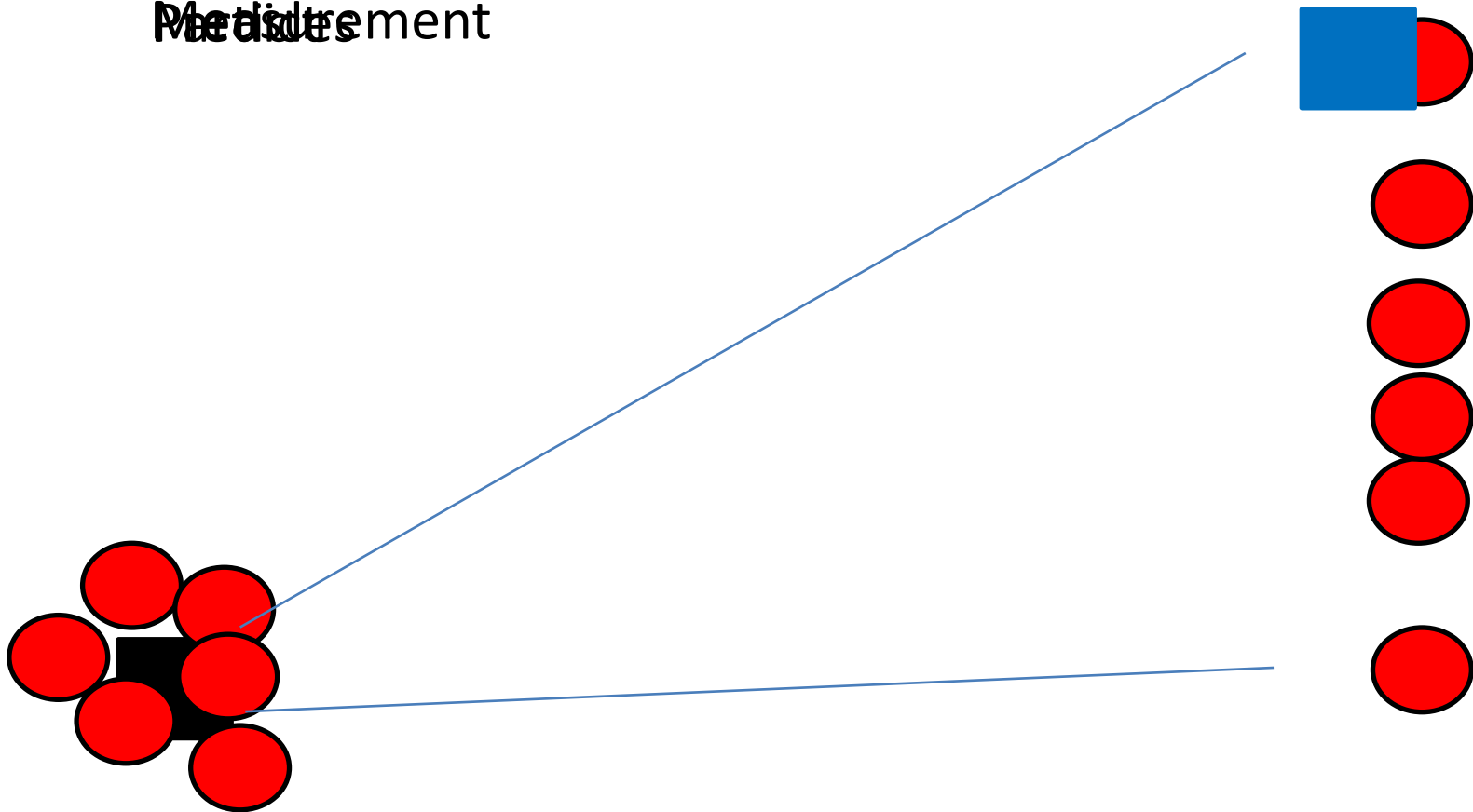


A Solution – Particle Filter



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Measurement

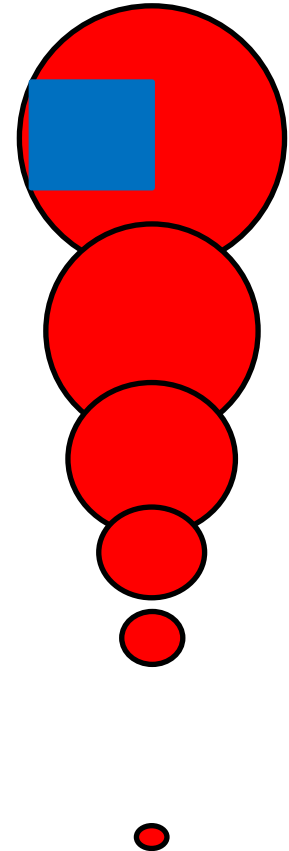
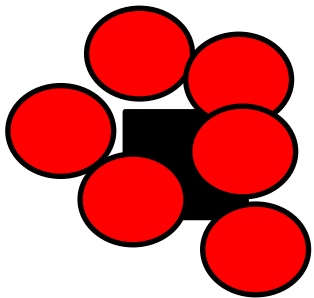


A Solution – Particle Filter



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Reweight

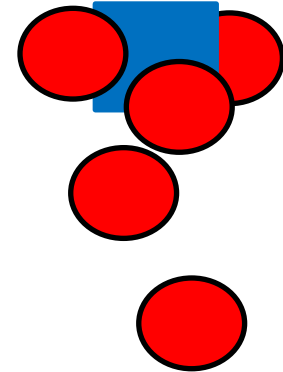
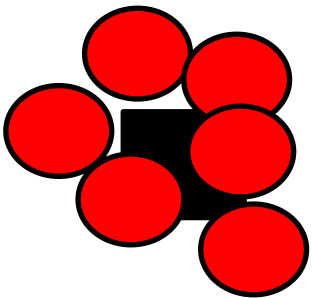


A Solution – Particle Filter



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Resample

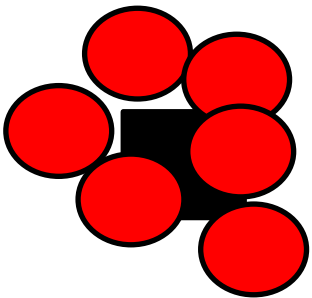


A Solution – Particle Filter



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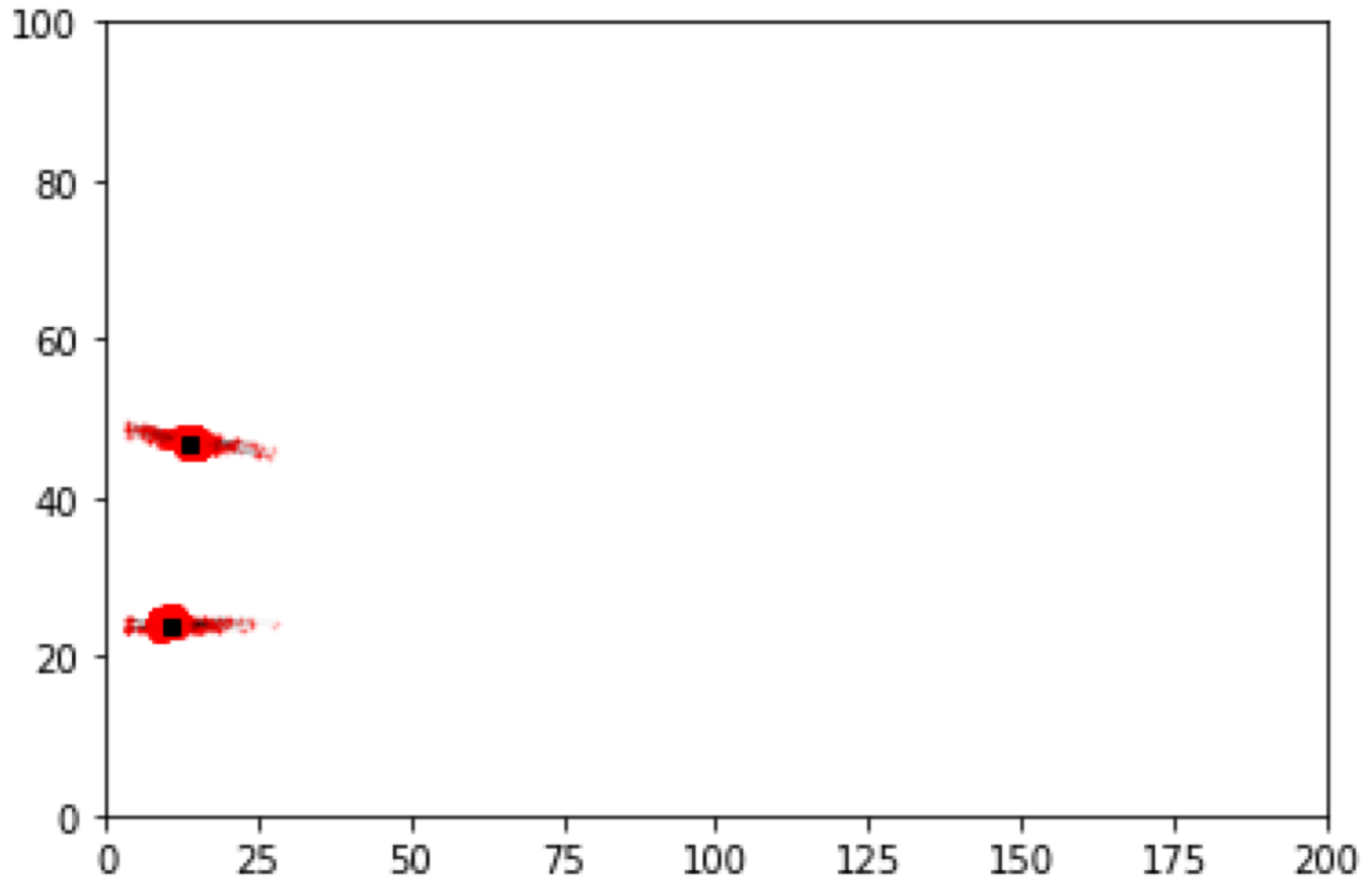
Estimate



Example



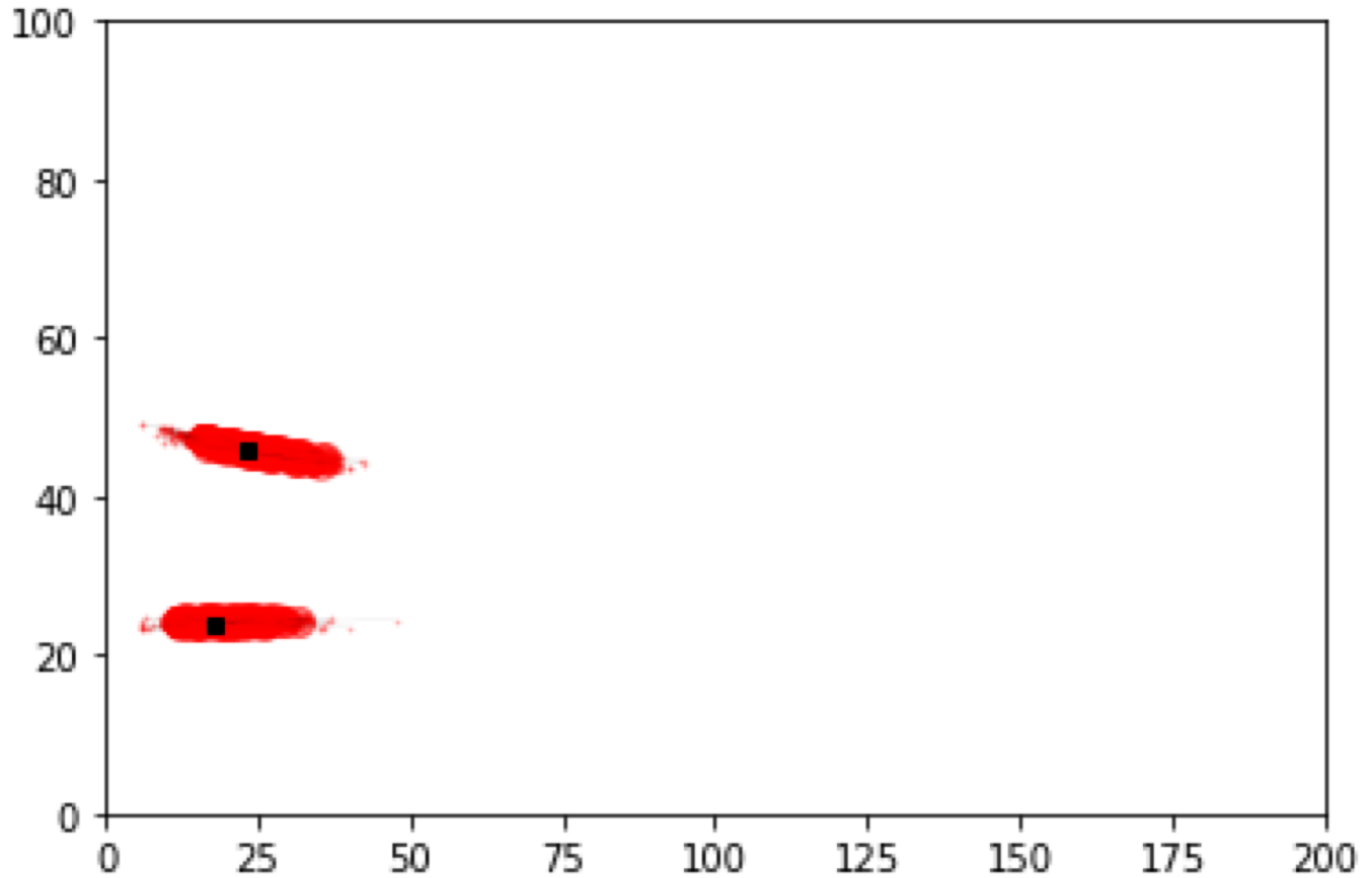
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Example



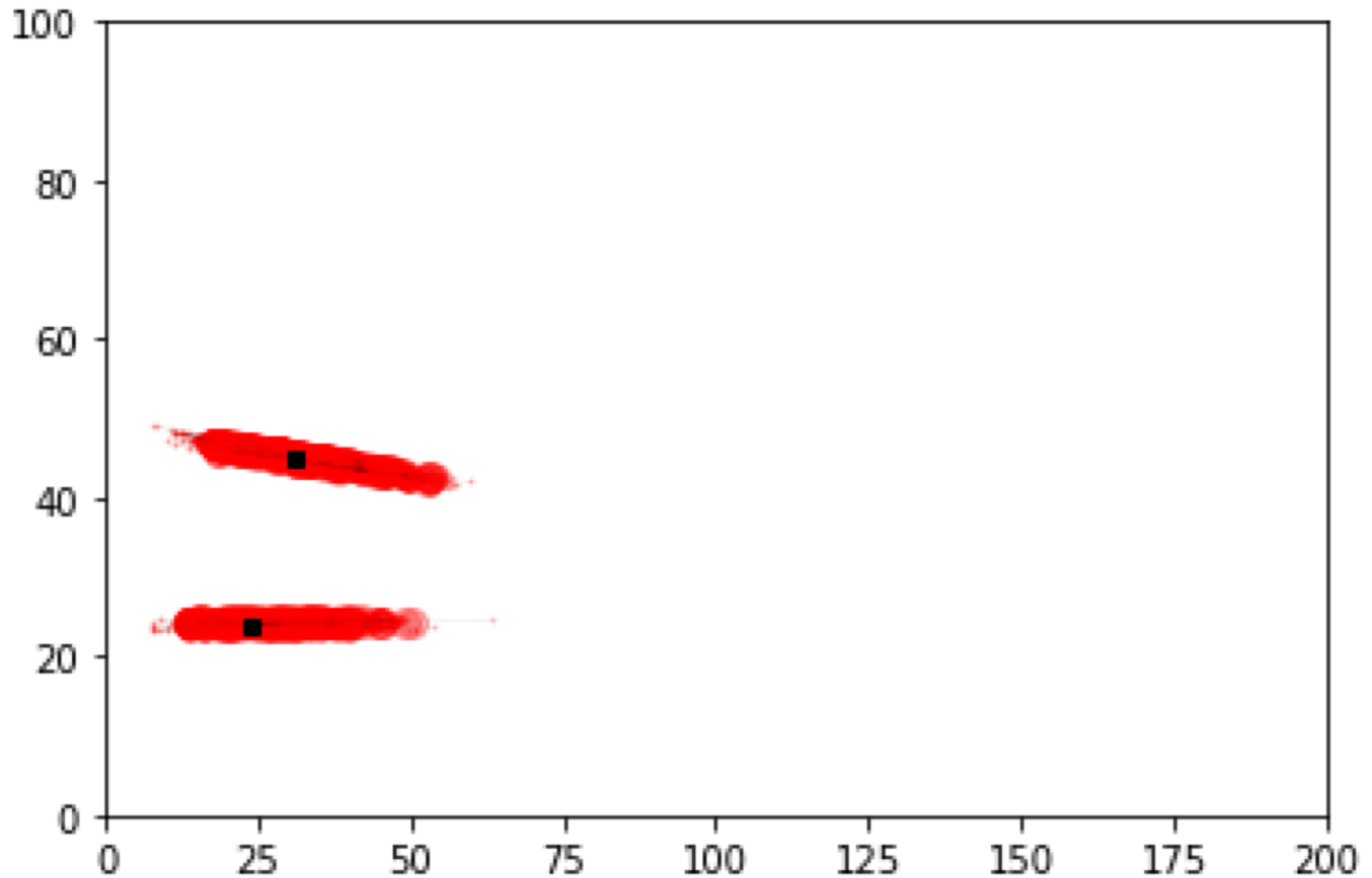
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Example



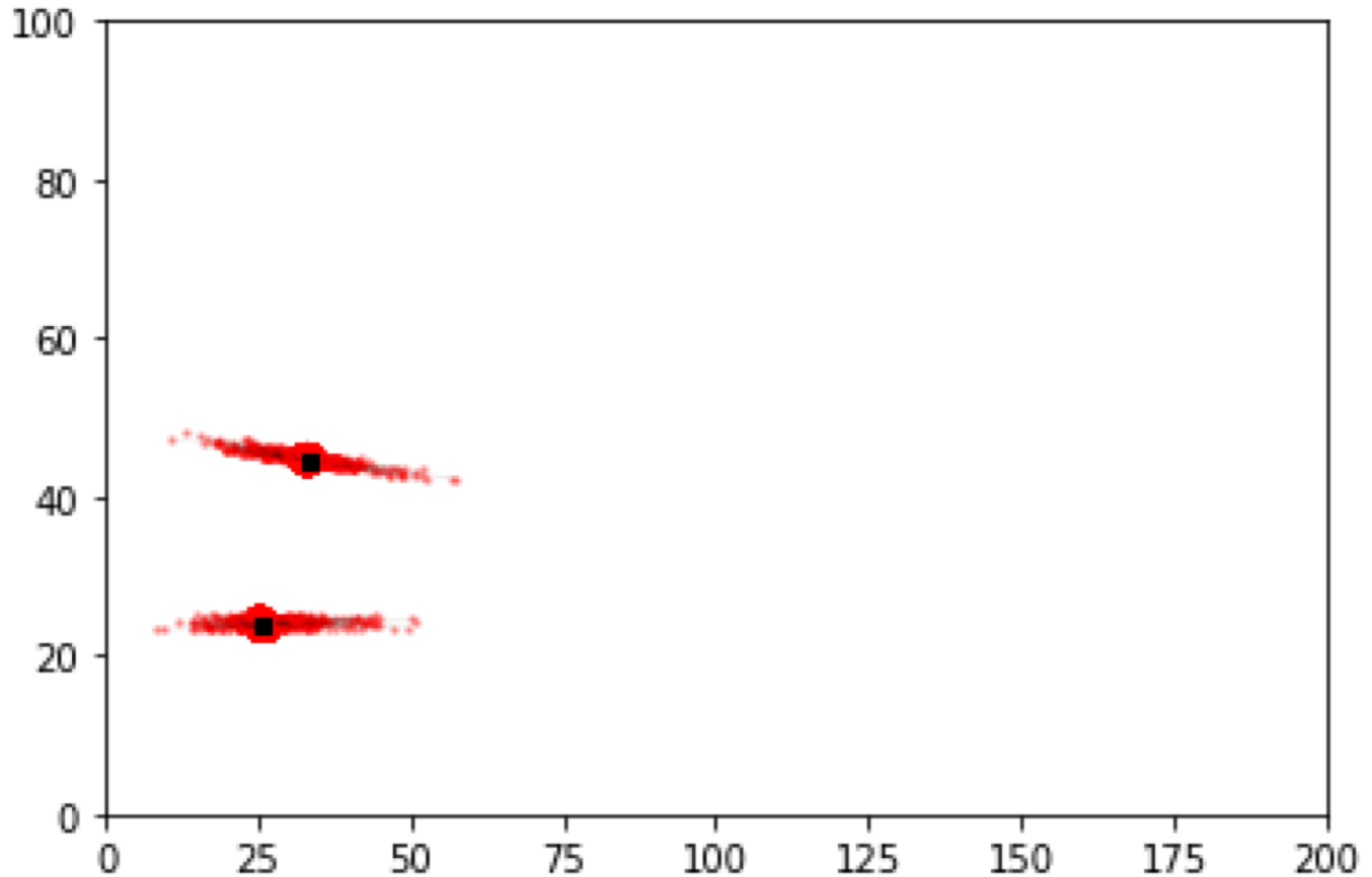
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Example



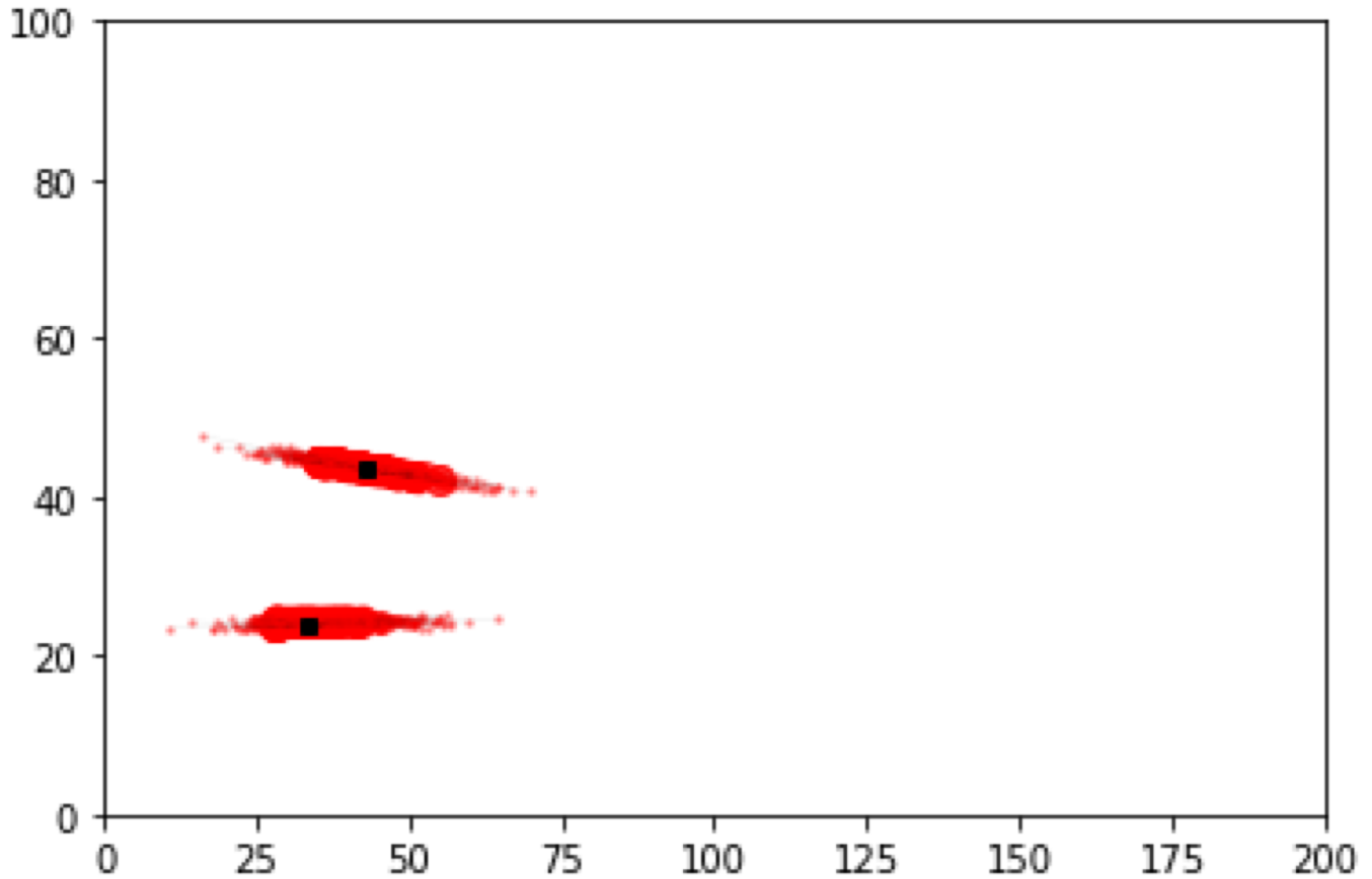
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Example



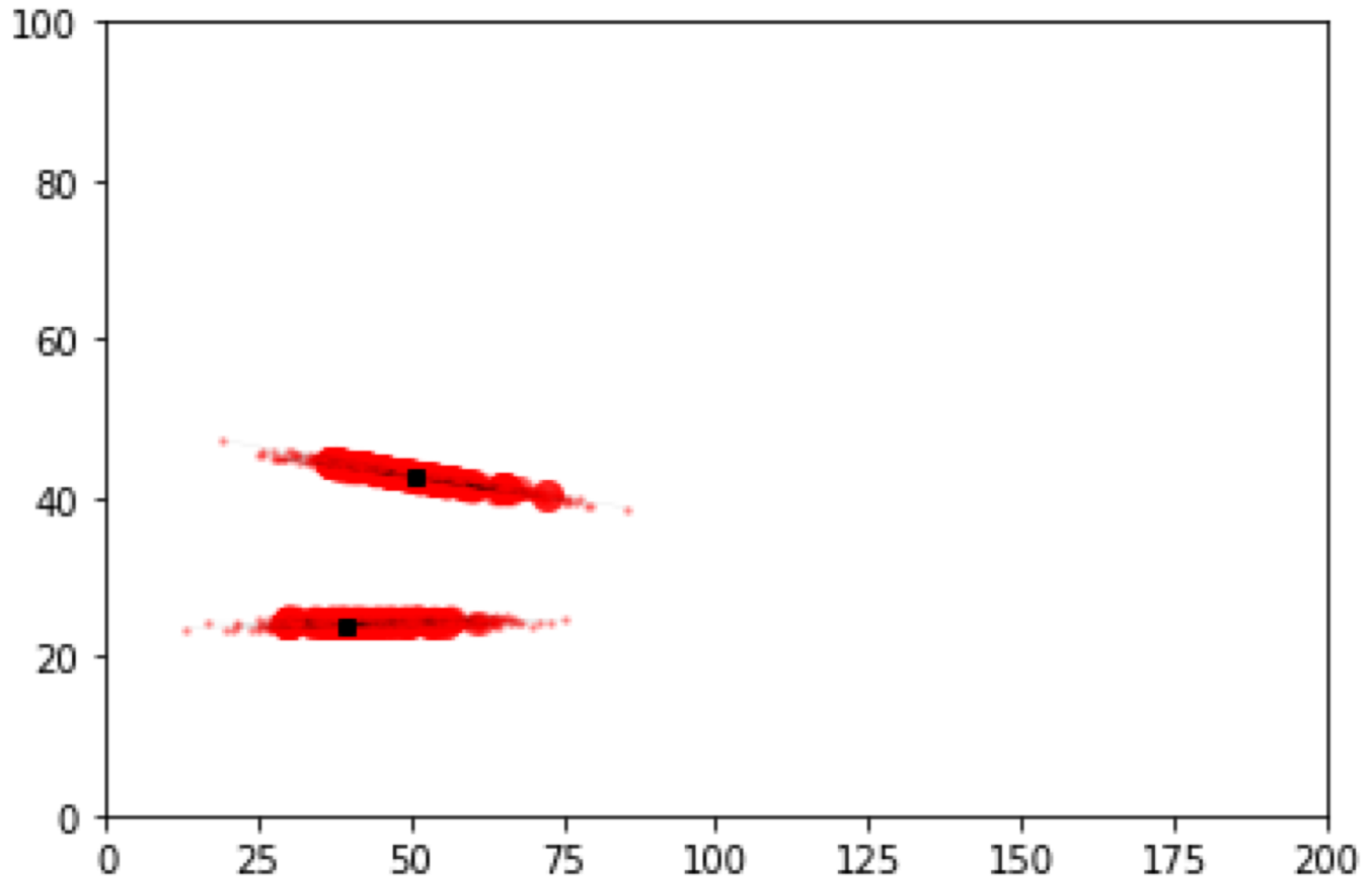
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Example



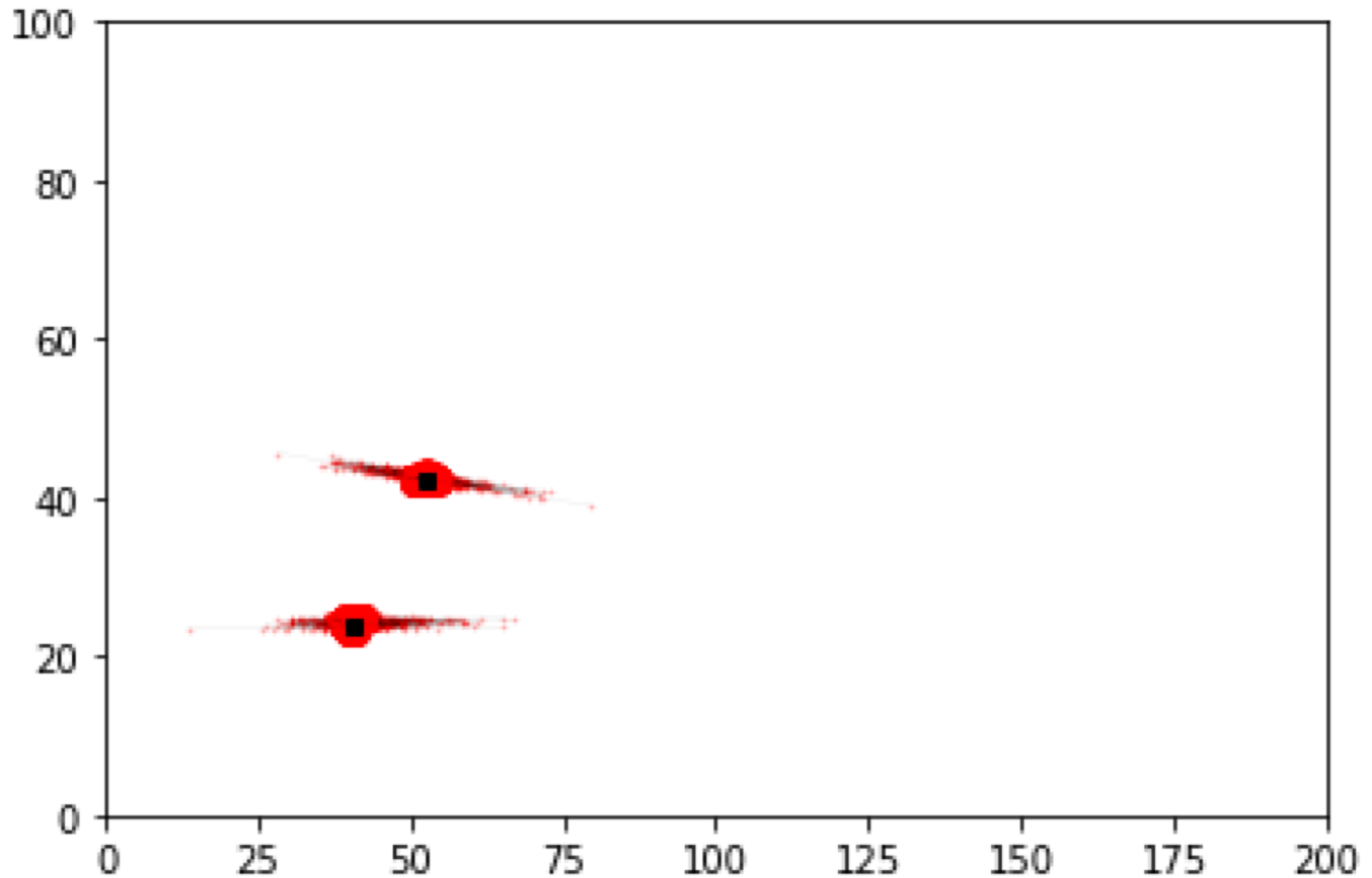
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Example



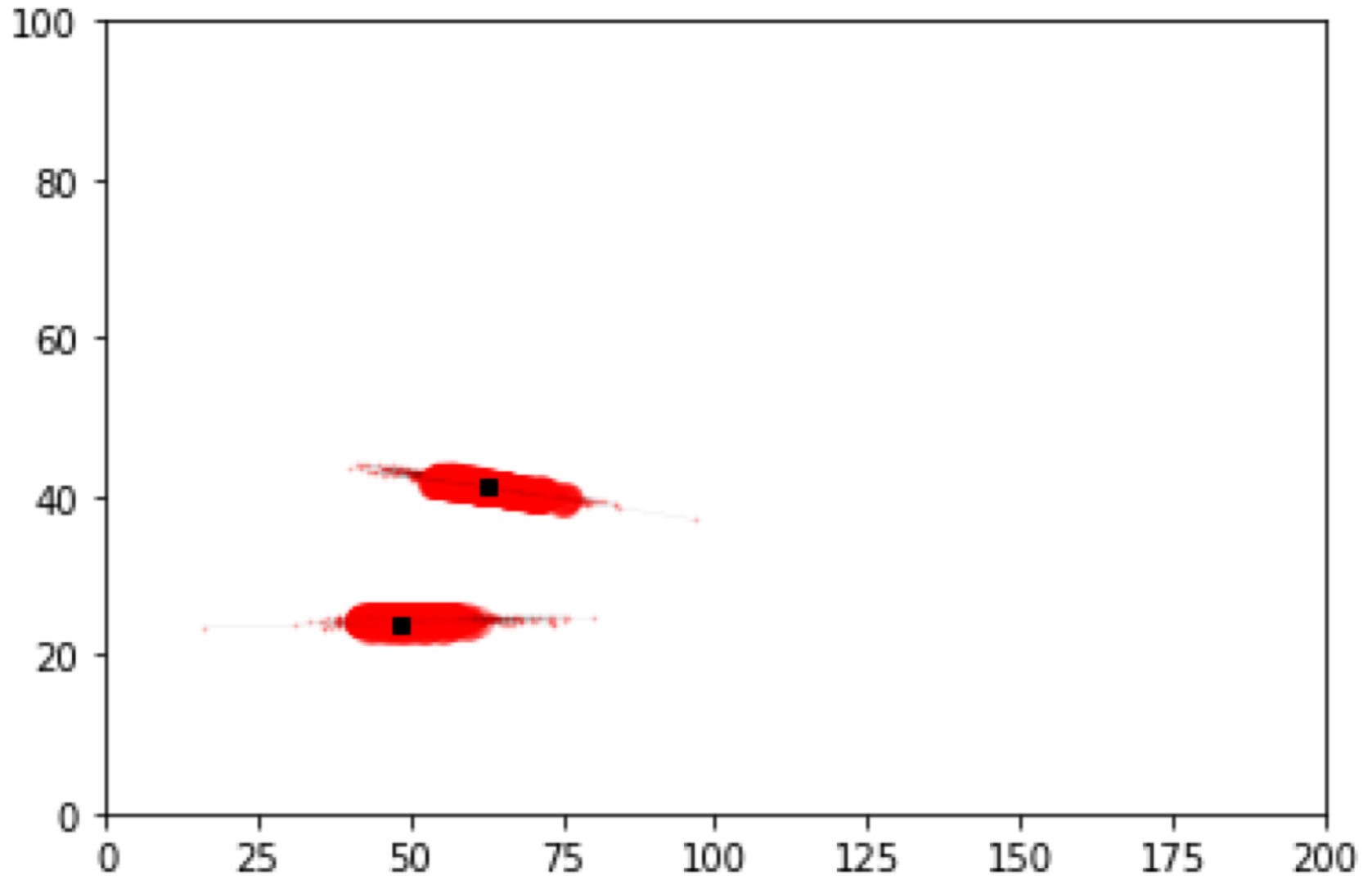
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Example



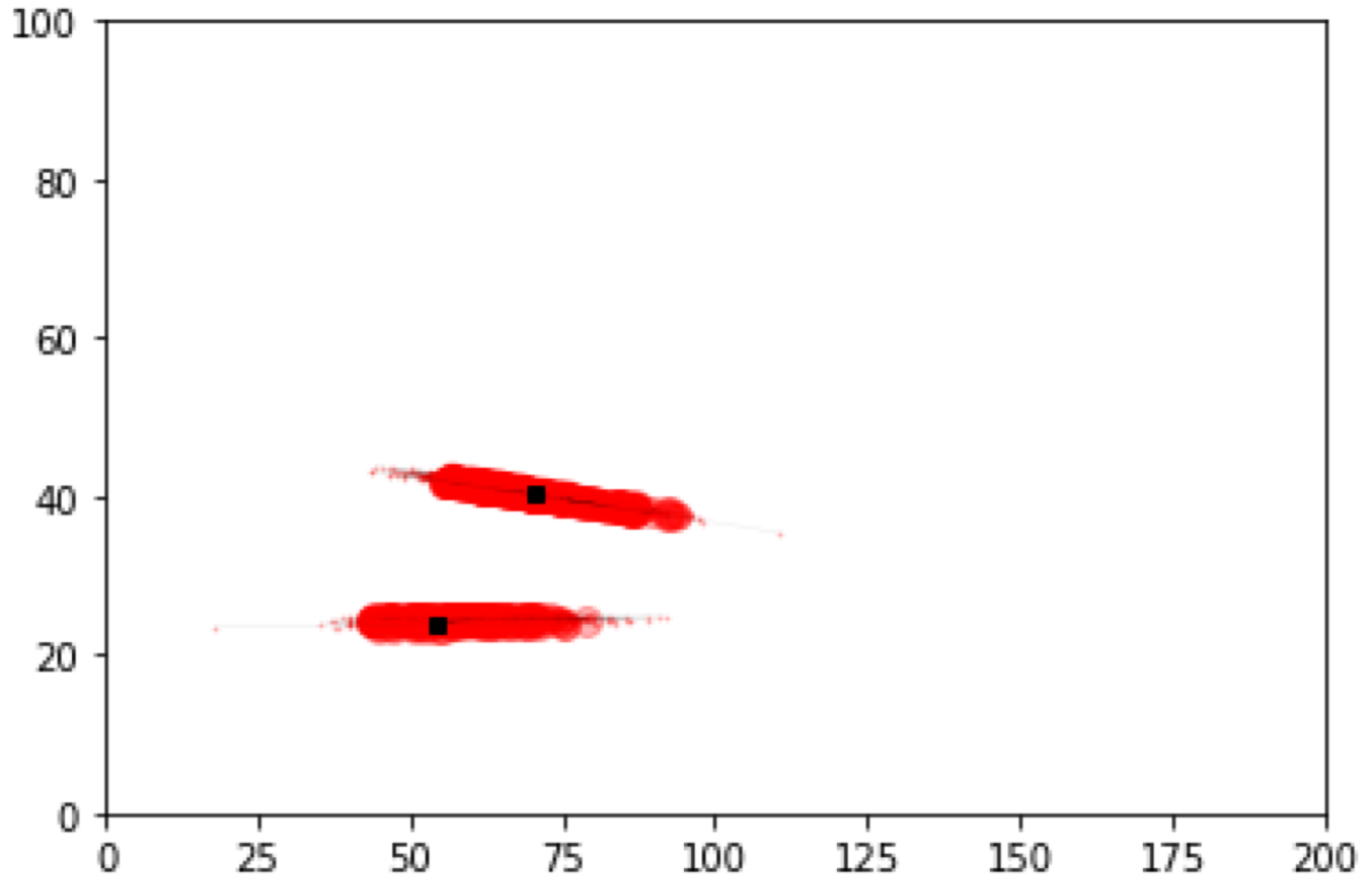
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Example



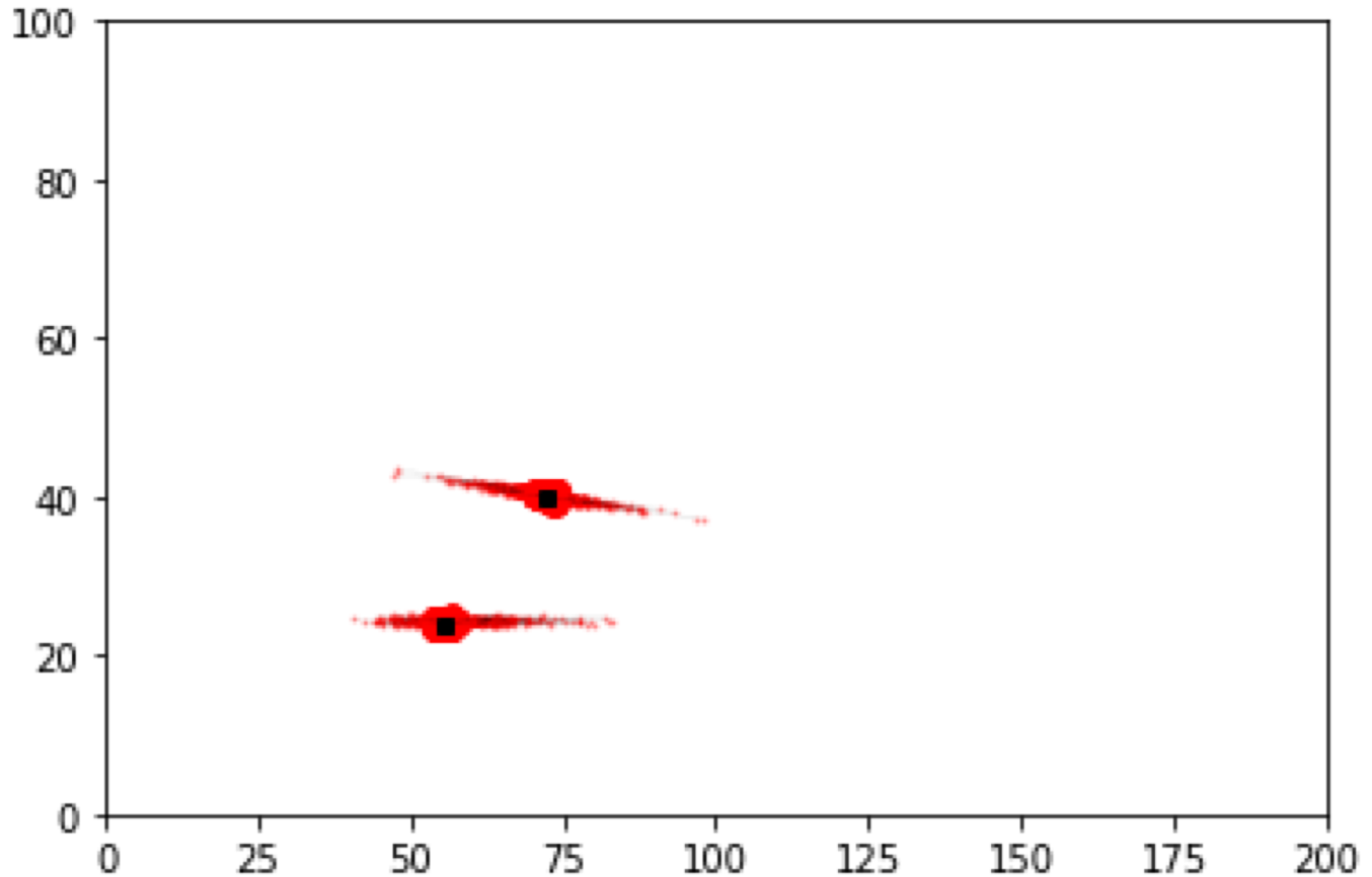
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Example



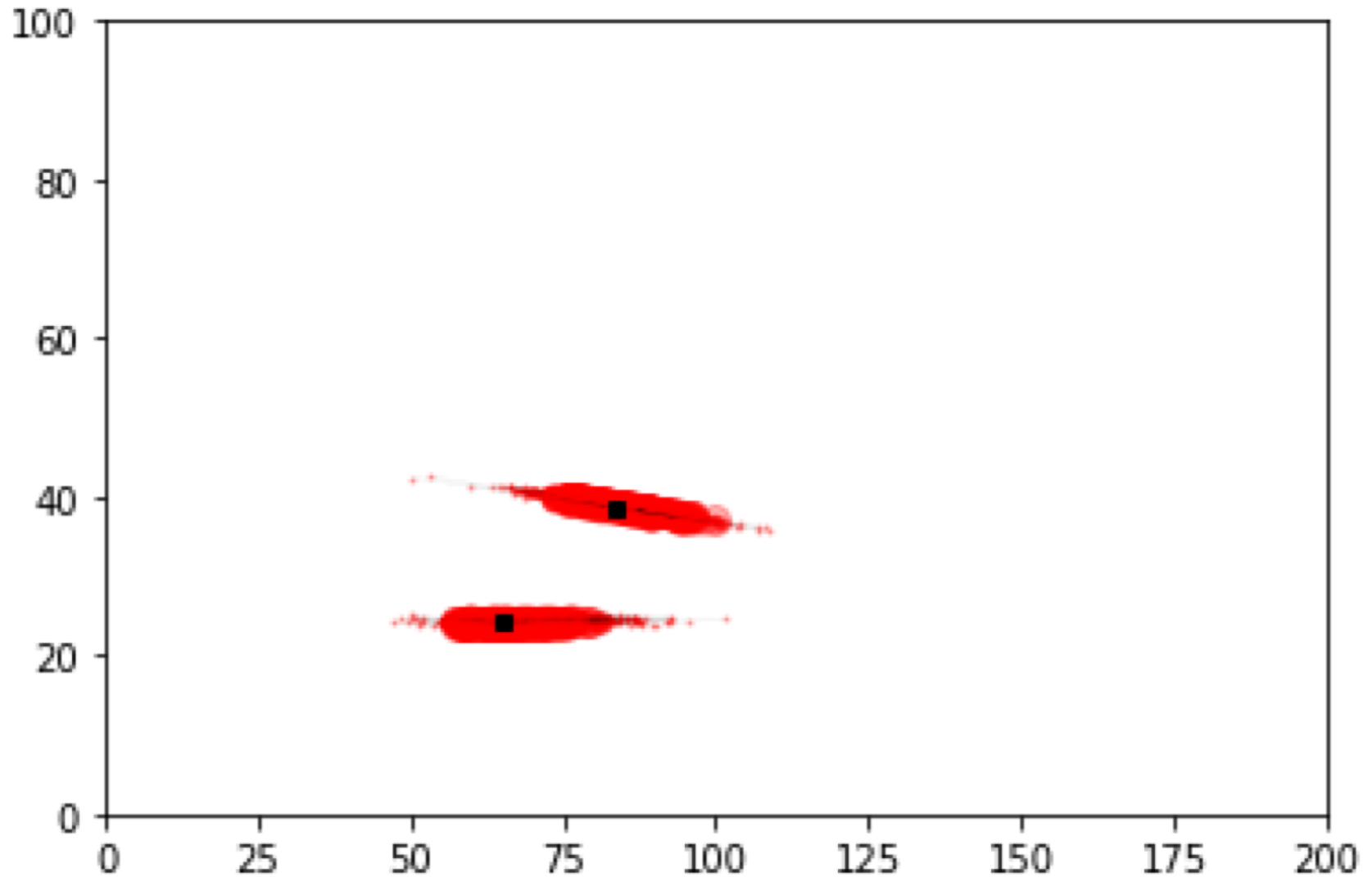
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Example



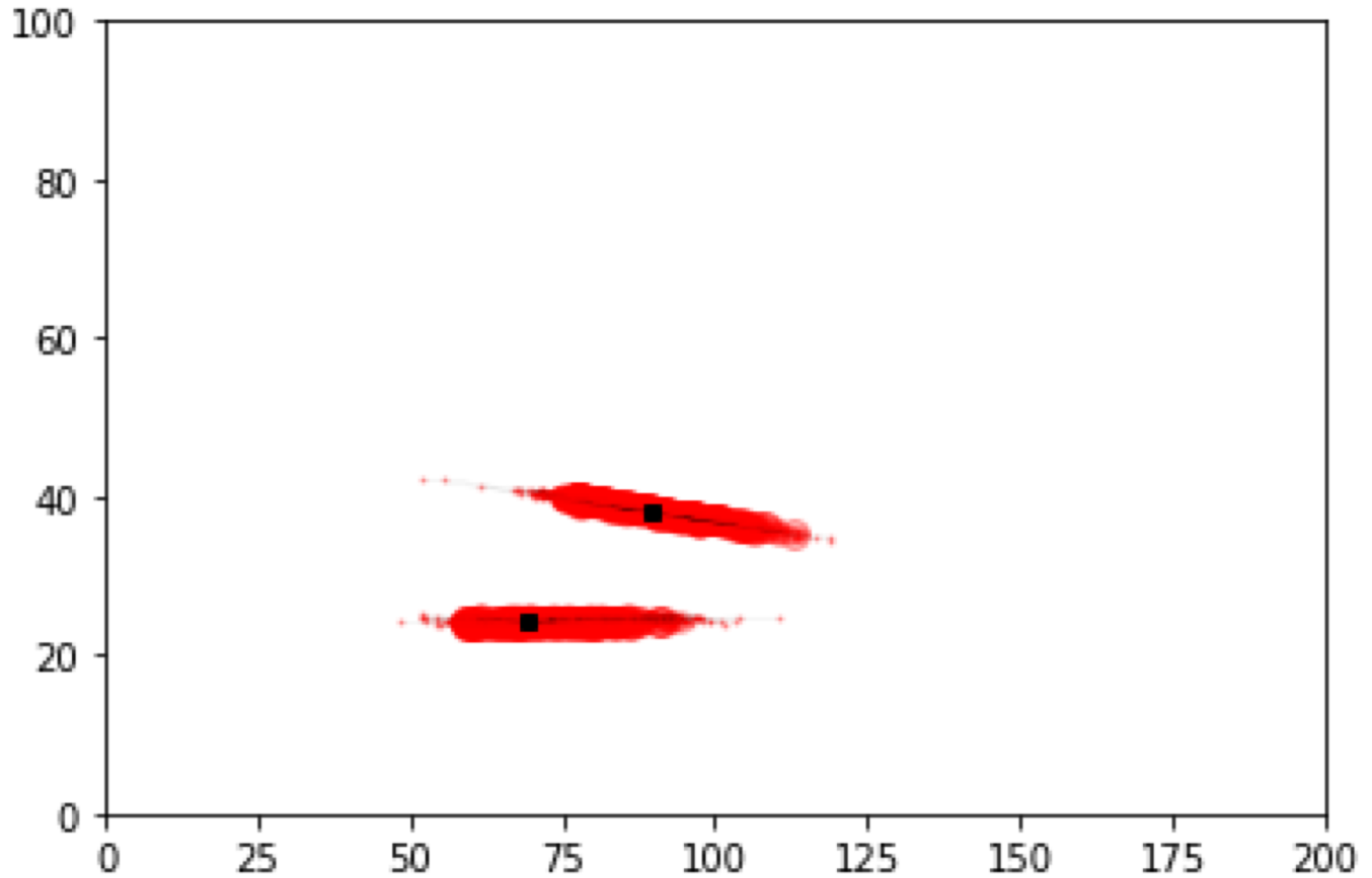
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Example



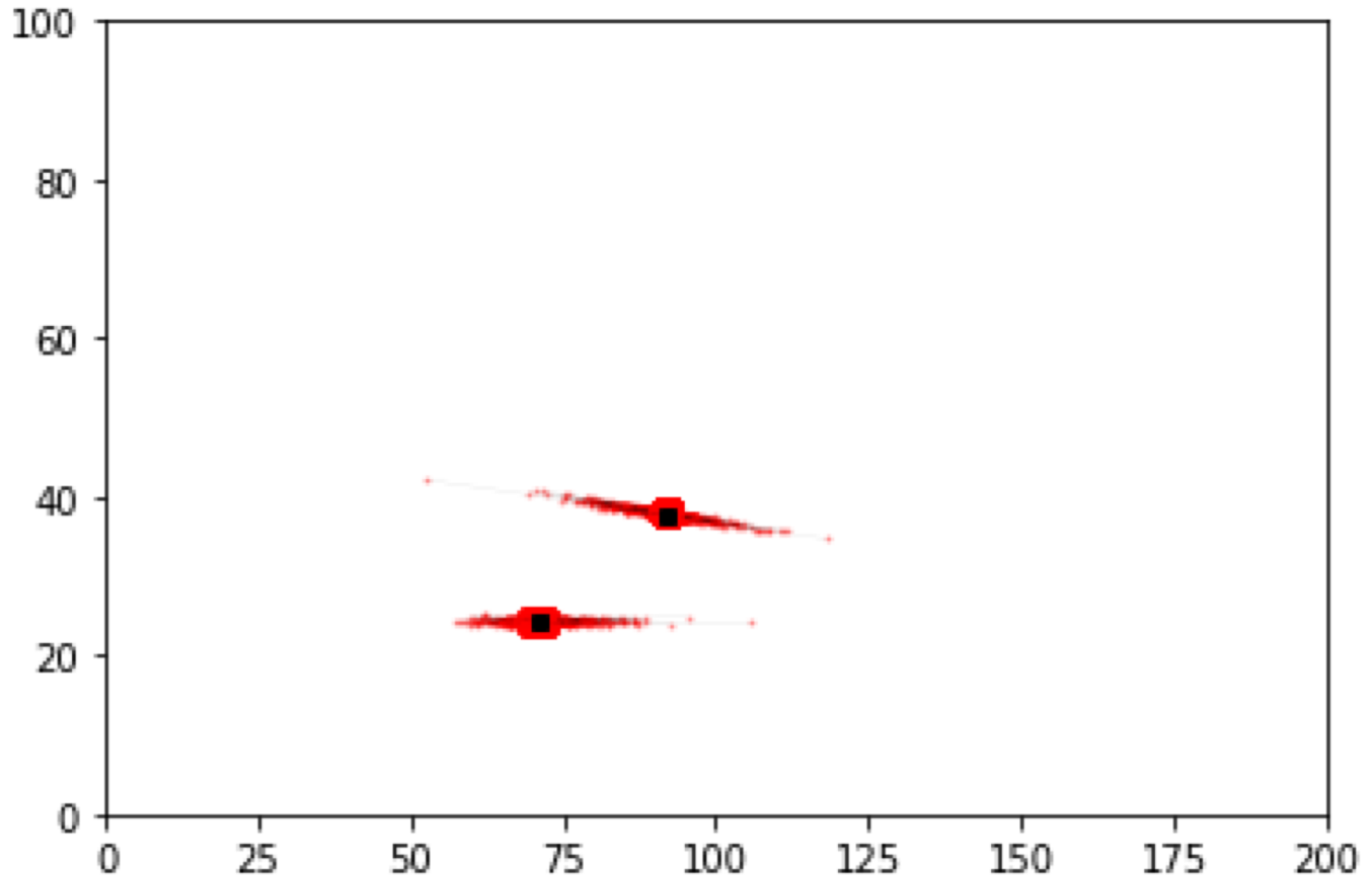
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Example



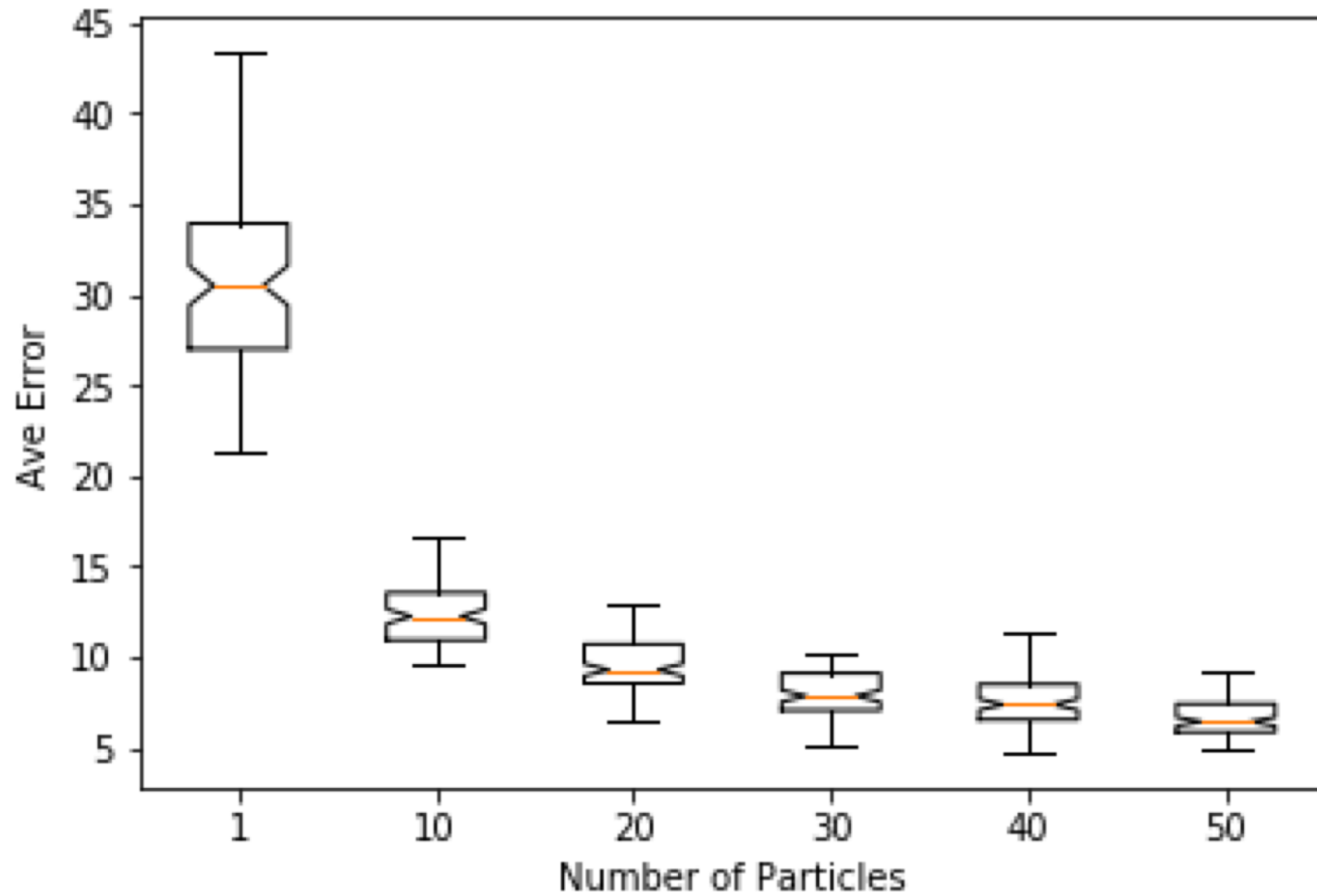
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Results



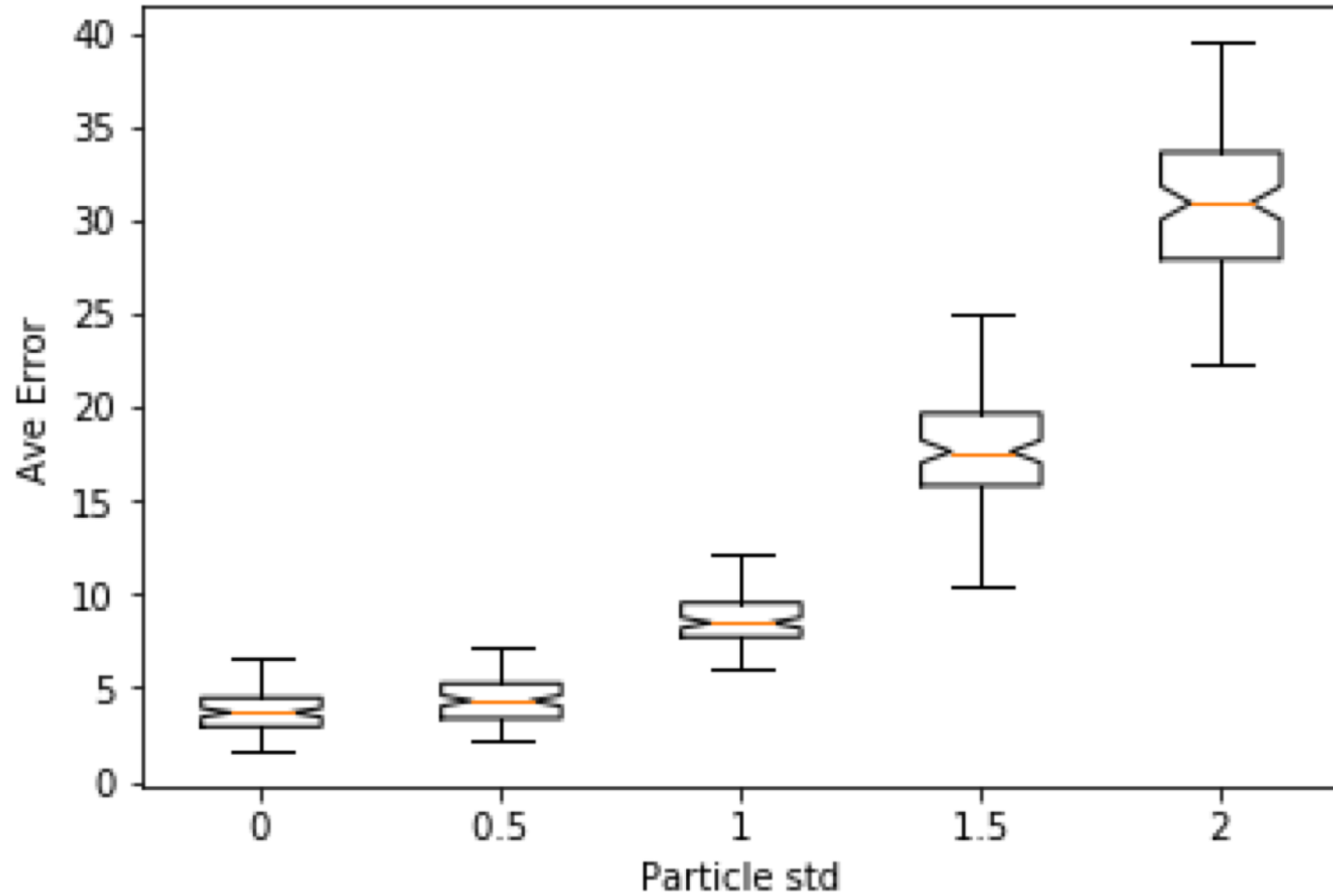
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Results



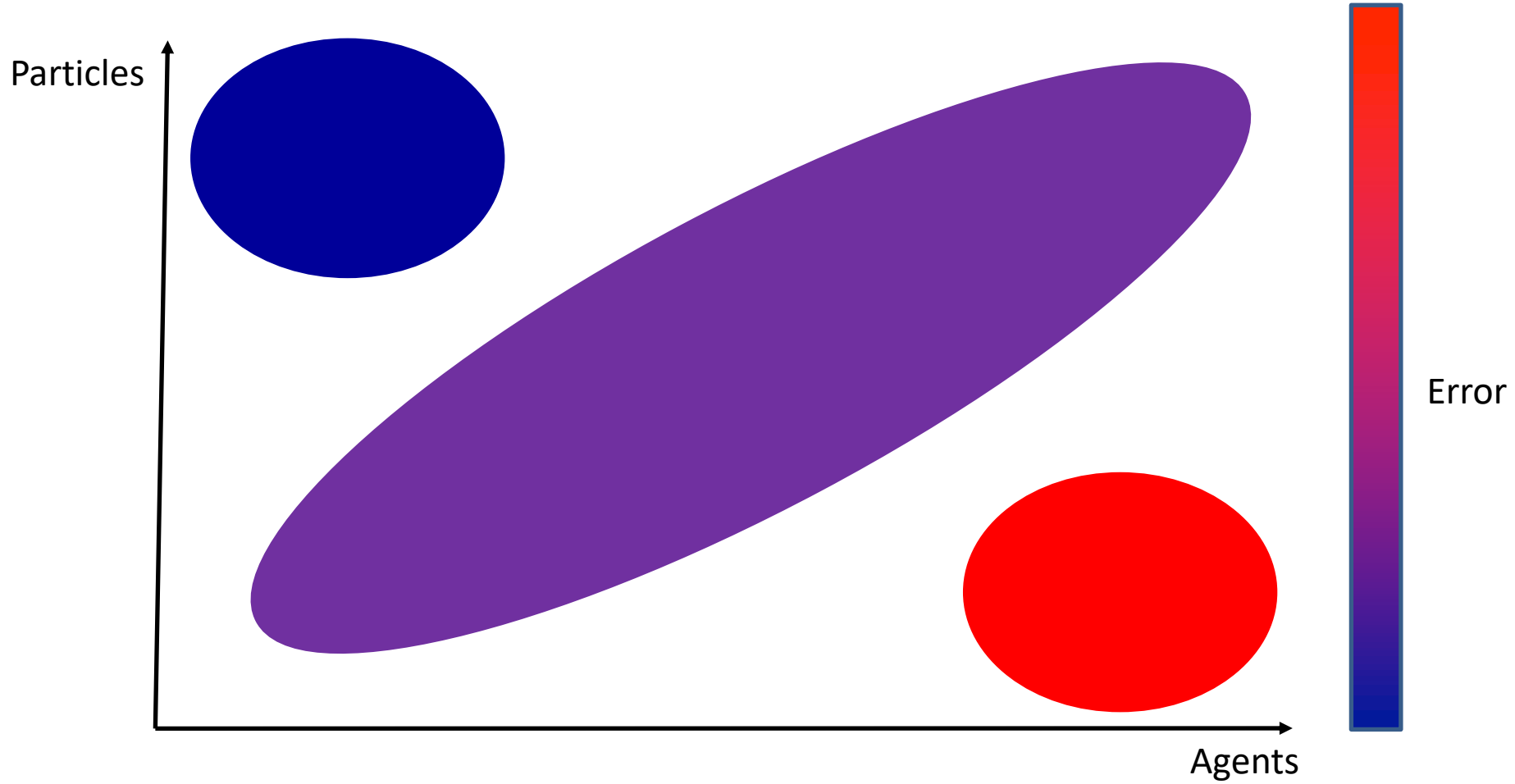
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Results



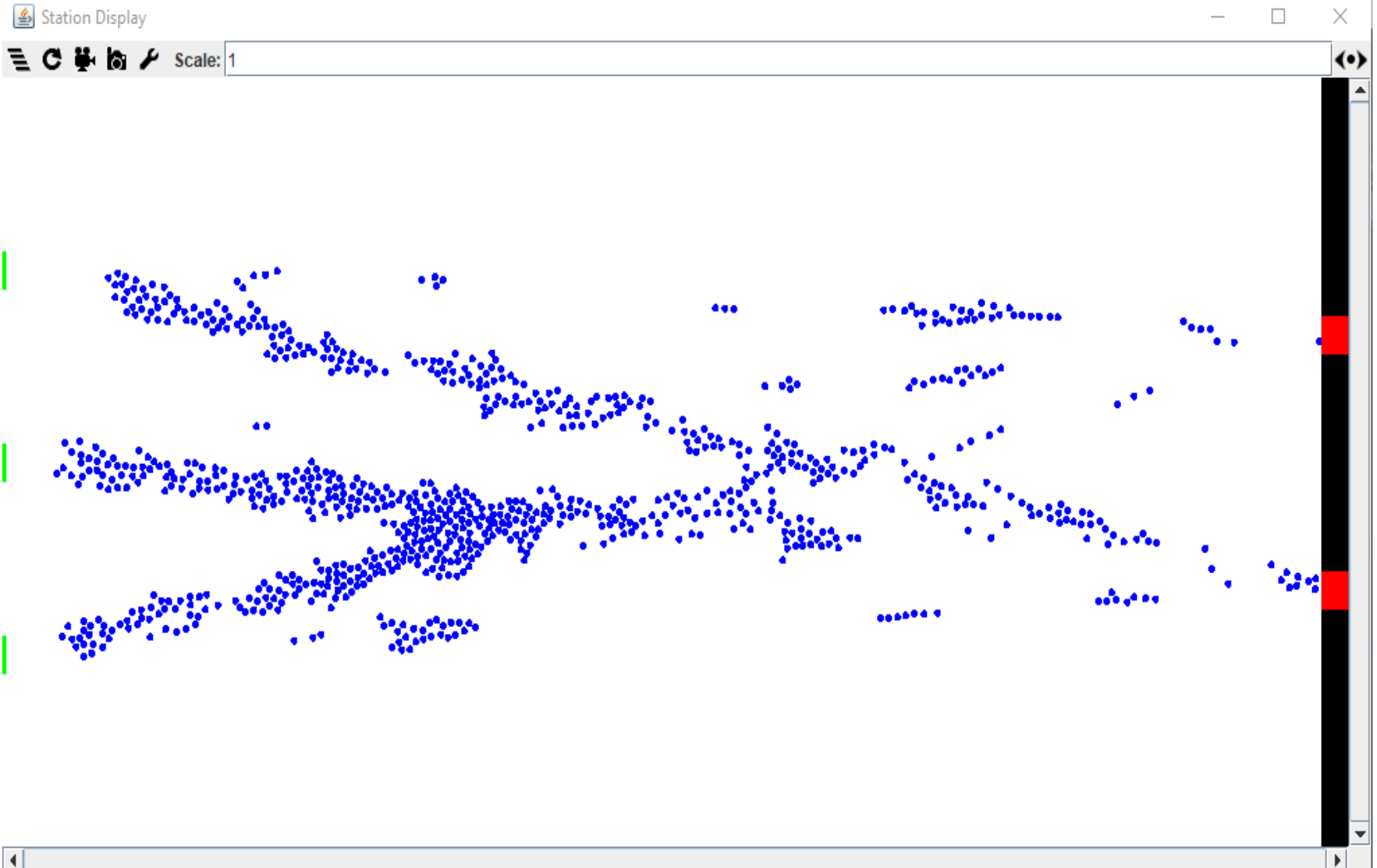
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Summary



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