

Automatic online tuning for fast Gaussian summation (Poster W61)

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$$G(\mathbf{y}_j) = \sum_{i=1}^N q_i \exp \left(-\frac{\|\mathbf{x}_i - \mathbf{y}_j\|^2}{h^2} \right), \quad j = 1, \dots, M$$

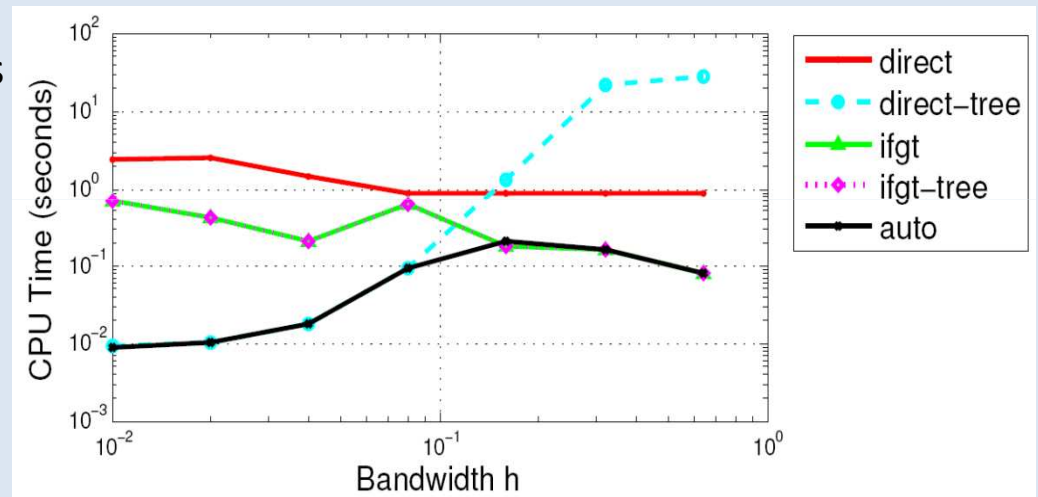
- Cost is quadratic
- Slows down kernel machines

Previous method (IFGT) takes linear time but

- is optimized for uniform distributions
- performs poorly for small bandwidths

Our Solution:

- use tree data structure
- **automatically tune** to distribution
- four methods, each optimal in different situations
- compares favorably with Dual-Tree methods as well



Black box approach: Automatically predict fastest method and tune its parameters for the given dataset.



Want to speed up your code? Download **FIGTree** (open source):

<http://sourceforge.net/projects/figtree>