

# Computer Graphics

Lecture 7: Monte Carlo Integration

Kartic Subr

# Using randomness



Georges-Louis Leclerc, Comte de Buffon  
(1707-1788)



# Using randomness



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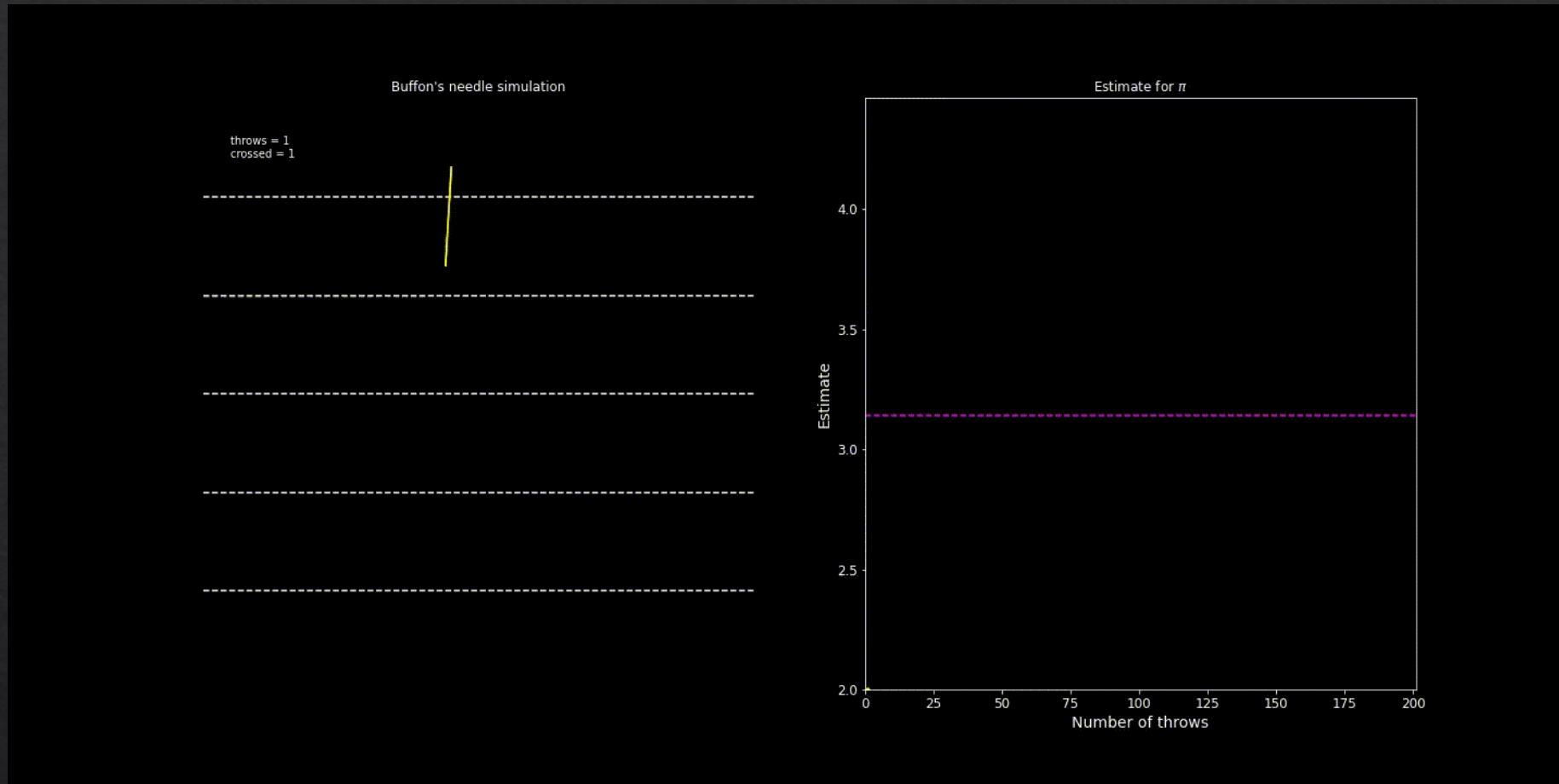
Suppose we have a floor made of parallel strips of wood, each the same width, and we drop a needle onto the floor. What is the probability that the needle will lie across a line between two strips?



$t$

$\ell < t$

# Using randomness



<https://people.orie.cornell.edu/sbanerjee/courses/orie4580f20/>  
<http://dmcpres.org/cm/buffon/experiment.html>



# Numerical integration using random samples

# From integrating circles to general functions



# Formally ...

# Importance sampling: intuition



# Importance sampling: definition