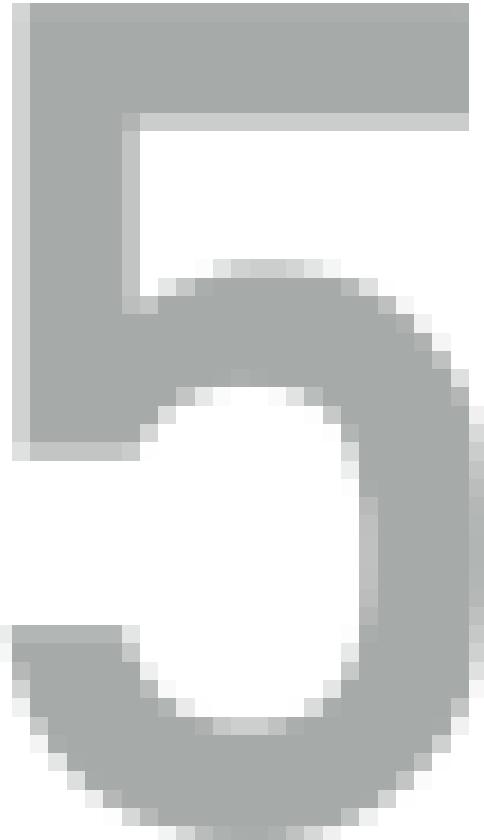
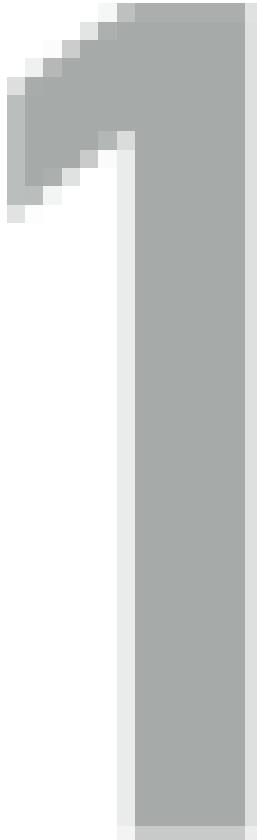


EXPERIMENTATION
AND SAMPLING



- ▶ Can estimate the average feature using expectations.

$$\pi[f] = \mathbb{E}_{X \sim \pi}[f(X)]$$

Expectations, probabilities, distributions, characteristics

If μ is some distribution such that $\mu[f] = \pi[f]$ for all bounded f then $\mu \vdash \pi$

If μ is some distribution such that $\mu[A] = \pi[A]$ for all A then $\mu = \pi$

► We will say that we can efficiently sample from X if we can compute $\pi[f]$ for any f

Given a sample X we can estimate $f: X \rightarrow \mathbb{R}$ using a statistic π , we can code features $f(X)$

→ This is a course on numerical integration.

SAMPLES VS EXPECTATIONS

- ▶ Given a sample $X \sim \pi$, we can code features $f(X)$ of X using a statistic $f : \mathbb{X} \rightarrow \mathbb{R}$
- ▶ Can estimate the average feature using expectations.

$$\pi[f] = \mathbb{E}_{X \sim \pi}[f(X)]$$

- ▶ Expectations, probabilities fully characterise distributions:
 - ▶ If μ is some distribution such that $\mu[A] = \pi[A]$ for all $A \subset \mathbb{X}$ then $\mu = \pi$
 - ▶ If μ is some distribution such that $\mu[f] = \pi[f]$ for all bounded f then $\mu = \pi$
- ▶ We will say that we can efficiently sample from X if we can provide we can efficiently compute $\pi[f]$ for any f
- ▶ This is basically a course on numerically computing integrals

MONTE CARLO METHODS: