ILLINOIS DATA SCIENCE INITIATIVE

# INTRODUCTION TO LARGE SCALE GRAPH BASED METHODS

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# Introduction to Large Scale Graph Based Methods

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https://github.com/lcdm-uiuc

## INTRODUCTION

This template is designed to assist with creating a two-column research article or letter to submit to *iDSI*.

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## EXAMPLES OF ARTICLE COMPONENTS

The sections below show examples of different article components.

## FIGURES AND TABLES

It is not necessary to place figures and tables at the back of the manuscript. Figures and tables should be sized as they are to appear in the final article. Do not include a separate list of figure captions and table titles.

Figures and Tables should be labelled and referenced in the standard way using the `\label{}` and `\ref{}` commands.

### Sample Figure

Figure **??** shows an example figure.

**Fig. 1.** False-color image, where each pixel is assigned to one of seven reference spectra.

### Sample Table

Table **??** shows an example table.

**Table 1. Shape Functions for Quadratic Line Elements**

| local node | $\{N\}_m$ | $\{\Phi_i\}_m$ $(i = x, y, z)$ |
|---|---|---|
| $m = 1$ | $L_1(2L_1 - 1)$ | $\Phi_{i1}$ |
| $m = 2$ | $L_2(2L_2 - 1)$ | $\Phi_{i2}$ |
| $m = 3$ | $L_3 = 4L_1L_2$ | $\Phi_{i3}$ |

## SAMPLE EQUATION

Let $X_1, X_2, \ldots, X_n$ be a sequence of independent and identically distributed random variables with $\mathrm{E}[X_i] = \mu$ and $\mathrm{Var}[X_i] = \sigma^2 < \infty$, and let

$$S_n = \frac{X_1 + X_2 + \cdots + X_n}{n} = \frac{1}{n}\sum_{i}^{n} X_i \qquad (1)$$

denote their mean. Then as $n$ approaches infinity, the random variables $\sqrt{n}(S_n - \mu)$ converge in distribution to a normal $\mathcal{N}(0, \sigma^2)$.

## SAMPLE ALGORITHM

Algorithms can be included using the commands as shown in algorithm **??**.

**Algorithm 1.** Euclid's algorithm

```
procedure EUCLID(a, b)                ▷ The g.c.d. of a and b
    r ← a mod b
    while r ≠ 0 do                    ▷ We have the answer if r is 0
        a ← b
        b ← r
        r ← a mod b
    return b                          ▷ The gcd is b
```

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