# Sample Paper Title: A Comprehensive Approach to Statistical Learning

**Élise de la Fontaine**                    ELISE.DELAFONTAINE@EXAMPLE.FR
*INRIA Paris*
*Paris, France*

**Amit Kumar Singh**                    AMIT.SINGH@EXAMPLE.IN
*Indian Institute of Technology*
*Mumbai, India*

**Fatima Al-Rahman**                    FATIMA.ALRAHMAN@EXAMPLE.SA
*King Abdullah University*
*Thuwal, Saudi Arabia*

**Yuki Tanaka**                    YUKI.TANAKA@EXAMPLE.JP
*University of Tokyo*
*Tokyo, Japan*

## Abstract

This is a sample abstract for a PMLR paper in double-column format. The abstract should be a brief summary of your paper, typically 100-200 words. It should clearly state the problem, your approach, and the main results. Mathematical notation can be included, such as $f(x) = \sum_{i=1}^{n} w_i x_i$, and the abstract can span multiple lines as needed.

**Keywords:** Machine Learning, Sample Paper, PMLR Format, Two Column

## 1. Introduction

This is a sample PMLR paper in double-column format. The double-column format is used for some PMLR proceedings, such as AISTATS. This format uses the `jmlr` class with both the `pmlr` and `twocolumn` options, which automatically sets the header to read "Proceedings of Machine Learning Research" and formats the content in two columns.

You can include citations using standard LaTeX citation commands, such as Author and Collaborator (2023) or (Author and Collaborator, 2023). Mathematical equations can be displayed:

$$f(x) = \int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi} \qquad (1)$$

In double-column format, equations and text automatically flow within the column width.

## 2. Methods

Here you would describe your methods. You can include figures using the standard `figure` environment. In two-column format, you can use `figure` for single-column figures or `figure*` for figures that span both columns:

For figures that need more space:

### 2.1. Algorithms

You can also include algorithms. Here's a simple example:

Figure 1: This is a single-column figure that fits within one column. Figures should be referenced in the text using `Figure 1`.

**Input:** Data $(x_1, \ldots, x_n)$
**Output:** Parameters $\theta$
Initialize $\theta$ randomly **while** *not converged*
 **do**
$\quad | \quad \nabla L(\theta) \leftarrow$ gradient $\quad \theta \leftarrow \theta - \eta \nabla L$
**end**
**return** $\theta$

 **Algorithm 1:** Sample stochastic gradient descent algorithm

## 3. Results

Present your results here. Tables can be formatted using the `booktabs` package. Similar to figures, you can use `table` for single-column tables or `table*` for tables that span both columns:

Table 1: Sample results (single column)

| Method | Accuracy |
|---|---|
| Baseline | 85.2% |
| Our Method | 92.1% |

## 4. Conclusion

Summarize your findings and their implications here. The double-column format allows for more compact presentation while maintaining readability.

## Acknowledgments

Acknowledge funding sources and collaborators here. Note that this section is unnumbered (using `section*`).

## References

Author, A. and Collaborator, B. Sample Paper Title. *Proceedings of Machine Learning Research*, 123:456–789, 2023.

## Appendix A. Additional Details

Any supplementary material, proofs, or additional details can be included in an appendix. In two-column format, appendix content also flows across both columns.

Figure 2: This is a double-column figure that spans both columns. Use `figure*` for wide figures. Note that these figures are typically placed at the top of a page.

Table 2: Detailed results spanning both columns

| Method | Accuracy | Precision | Recall | F1-Score | Training Time (s) |
|---|---|---|---|---|---|
| Baseline | 85.2% | 83.1% | 87.3% | 85.1% | 120 |
| Method A | 89.5% | 88.2% | 90.8% | 89.5% | 110 |
| Our Method | 92.1% | 91.5% | 92.7% | 92.1% | 95 |