

# This Is An Example of Article Title

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Author1<sup>1</sup>, Author2<sup>2</sup>, Author3<sup>2</sup> and Author4<sup>2,\*</sup>

<sup>1</sup>This is an example of Affiliation r Author 1

<sup>2</sup>This is an example of Affiliation for Author 2

## Abstract

Now we are engaged in a great civil war, testing whether that nation, or any nation, so conceived, and so dedicated, can long endure. We are met here on a great battlefield of that war. We have come to dedicate a portion of it as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

**Keywords:** keyword1 – keyword2 – keyword3 – keyword4 – keyword5

## 1 INTRODUCTION

Four score and seven years ago our fathers brought forth, upon this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal.

Now we are engaged in a great civil war, testing whether that nation, or any nation, so conceived, and so dedicated, can long endure. We are met here on a great battlefield of that war. We have come to dedicate a portion of it as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

But in a larger sense we can not dedicate – we can not consecrate – we can not hallow this ground. The brave men, living and dead, who struggled, here, have consecrated it far above our poor power to add or detract. The world will little note, nor long remember, what we say here, but can never forget what they did here. It is for us, the living, rather to be dedicated here to the unfinished work which they have, thus far, so nobly carried on Abt (1961). It is rather for us to be here dedicated to the great task remaining before us that from these honoured dead we take increased devotion to that cause for which they here gave the last full measure of devotion that we here highly resolve that these dead shall not have died in vain; that this nation shall have a new birth of freedom; and that this government Abt (1961) of the people, by the people, for the people, shall not perish from the earth.

Now we are engaged in a great civil war, testing whether that nation, Abt (1967) or any nation, so conceived, and so dedicated, can long endure. We are met

here on a great battlefield of that war. We have come to dedicate a portion of it as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this (see Table 1).

But in a larger sense we can not dedicate – we can not consecrate – we can not hallow this ground. The brave men, living and dead, who struggled, here, have consecrated it far above our poor power to add or detract. The world will little note, nor long remember, what we say here, but can never forget what they did here. It is for us, the living, rather to be dedicated here to the unfinished work which they have, thus far, Lanzetta et al. (1991), so nobly carried on. It is rather for us to be here dedicated to the great task remaining before us that from these honoured dead we take increased devotion to that cause for which they here gave the last full measure of devotion that we here highly resolve that these dead shall not have died in vain; that this nation shall have a new birth of freedom; and that this government of the people, by the people, for the people, shall not perish from the earth.

Four score and seven years ago our fathers brought forth, upon this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal Sargent, Boksenberg, & Steidel Sargent et al. (1988).

## 2 THIS IS AN EXAMPLE OF HEAD LEVEL 1

But in a larger sense we can not dedicate – we can not consecrate – we can not hallow this ground. The brave men, living and dead, who struggled, here, have

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\*This is an example of author footnote

**Table 1** This is an example of table caption.

Dimension	Classification accuracy
1	0.6232
2	0.9635
3	0.9724
4	0.9690
5	0.9840
6	0.9842
7	0.9873
8	0.9884
9	0.9873
10	0.9898
11	0.9914

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## 2.1 This is an example of head level 2

Now we are engaged in a great civil war, testing whether that nation, or any nation, so conceived, and so dedicated, can long endure. We are met here on a great battlefield of that war. We have come to dedicate a portion of it as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

This is a longer quotation. It consists of two paragraphs of text, neither of which are particularly interesting.

This is the second paragraph of the quotation. It is just as dull as the first paragraph.

### 2.1.1 This is an example of head level 3

But in a larger sense we can not dedicate – we can not consecrate – we can not hallow this ground. The brave men, living and dead, who struggled, here, have consecrated it far above our poor power to add or detract. The world will little note, nor long remember, what we say here, but can never forget what they did here. It is for us, the living, rather to be dedicated here to the unfinished work which they have, thus far, so nobly

carried on. It is rather for us to be here dedicated to the great task remaining before us that from these honoured dead we take increased devotion to that cause for which they here gave the last full measure of devotion that we here highly resolve that these dead shall not have died in vain; that this nation shall have a new birth of freedom; and that this government of the people, by the people, for the people, shall not perish from the earth.

*This is an example of head level 4.* Now we are engaged in a great civil war, testing whether that nation, or any nation, so conceived, and so dedicated, can long endure. We are met here on a great battlefield of that war. We have come to dedicate a portion of it as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this. Let

$$x = (x_1, \dots, x_n) \in R^n$$

be an  $n$ -dimensional vector. The sparse PCA problem can be written as

$$\max_x \{x^T A x - \rho \|x\|_0 : x^T x = 1\}, \quad (1)$$

It is for us, the living, rather to be dedicated here to the unfinished work which they have, thus far, so nobly carried on. It is rather for us to be here dedicated to the great task remaining before us that from these honoured dead we take increased devotion to that cause for which they here gave the last full measure of devotion equation (1).

$$\max_x \{x^T A x : x^T x = 1\}.$$

If  $A$  The brave men, living and dead, who struggled, here, have consecrated it far above our poor power to add or detract. The world will little note, nor long remember, what we say here.

Equation (1) is a special case of the following sparse generalized eigenvector problem (GEV):

$$\max_x \{x^T A x - \rho \|x\|_0 : x^T B x \leq 1\}, \quad (2)$$

Now we are  $A \in S^n$  engaged in a great civil war, testing whether that nation, or any nation, so conceived, and so dedicated, can long endure.  $\|x\|_\epsilon = \sum_{i=1}^n \frac{\log(1 + \frac{|x_i|}{\epsilon})}{\log(1 + \frac{1}{\epsilon})}$ .

We are met here on a great battlefield of that war. We have come to dedicate a portion of it as a final resting place for those who here gave their lives that that nation might live.  $\|x\|_0$  by  $\|x\|_1$  It is altogether fitting and proper that we should do this in (2).

Let  $\rho_\epsilon = \rho / \log(1 + \frac{1}{\epsilon})$ . It is for us, the living, rather to be dedicated here to the unfinished work which they have, thus far:

$$\min_{x,y} \{ \tau \|x\|_2^2 - [x^T (A + \tau I_n) x - \rho_\epsilon \sum_{i=1}^n \log(y_i + \epsilon)] : \quad (3)$$

$$x^T B x \leq 1, -y \leq x \leq y \} \quad (4)$$

by choosing an appropriate  $\tau \in R$  such that  $A + \tau I_n \in S_+^n$  (the set of positive semidefinite matrices of size  $n \times n$  defined over  $R$ ). Suppose

$$\begin{aligned} g((x, y), (z, w)) &:= \tau \|x\|_2^2 - z^T (A + \tau I_n) z \\ &+ \rho_\epsilon \sum_{i=1}^n \log(\epsilon + w_i) - 2(x - z)^T \\ &+ \rho_\epsilon \sum_{i=1}^n \frac{y_i - w_i}{w_i + \epsilon}, \end{aligned}$$

which is the majorization function of

$$f(x, y) = \tau \|x\|_2^2 + \rho_\epsilon \sum_{i=1}^n \log(\epsilon + y_i) - x^T (A + \tau I_n) x. \quad (5)$$

We have come to dedicate a portion of it as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

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There is an environment for verse  
Whose features some poets will curse.

For instead of making  
Them do *all* line breaking,  
It allows them to put too many words on a line  
when they'd rather be forced to be terse.

If A The brave men, living and dead, who struggled, here, have consecrated<sup>1</sup> it far above our poor power to add or detract. The world will little note, nor long remember, what we say here Table 2.

### 3 THIS IS AN EXAMPLE OF HEAD LEVEL 1

But in a larger sense we can not dedicate – we can not consecrate – we can not hallow this ground. The brave men, living and dead, who struggled, here, have consecrated it far above our poor power to add or detract. The world will little note, nor long remember, what we say here, but can never forget what they did here. It is for us, the living, rather to be dedicated here to the unfinished work which they have, thus far, so nobly carried on. It is rather for us to be here dedicated to the great task remaining before us that from these honoured dead we take increased devotion to that cause for which they here gave the last full measure of devotion that

we here highly resolve that these dead shall not have died in vain; that this nation shall have a new birth of freedom; and that this government of the people, by the people, for the people, shall not perish from the earth.

- This is a longer itemize list. It consists of two paragraphs of text, neither of which are particularly interesting II.
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1. This is a longer numbered list. It consists of two paragraphs of text, neither of which are particularly interesting.
2. This is a short numbered list. It consists of two paragraphs of text.

Now we are engaged in a great civil war, testing whether that nation, or any nation, so conceived, and so dedicated, can long endure. We are met here on a great battlefield of that war. We have come to dedicate a portion of it as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

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First unnumbered item which has no label. This is an example of sample text for unnumbered list. This is an example of sample text for unnumbered list. This is an example of sample text for unnumbered list.

Second unnumbered item.  
Third unnumbered item.

<sup>1</sup>This is an example of text footnote.

**Table 2** It is rather for us to be here dedicated to the great  $\alpha^{(1)}$  and  $\alpha^{(2)}$  task remaining before us that from these honoured dead we take increased devotion to that cause for which they here gave the last.

Layer number	$V_{P0}$ (km/s)	$V_{S0}$ (km/s)	$\epsilon^{(1)}$	$\epsilon^{(2)}$	$\delta^{(1)}$	$\delta^{(2)}$	$\delta^{(3)}$	$\gamma^{(1)}$	$\gamma^{(2)}$	$\alpha^{(1)}$ ( $^{\circ}$ )	$\alpha^{(2)}$ ( $^{\circ}$ )
1	3.5	2.0	0.20	-0.05	0.00	-0.20	-0.05	0.20	0.05	20	10
2	2.5	1.5	0.10	-0.15	0.05	-0.15	0.00	0.10	-0.05	20	40
3	3.0	1.8	0.20	-0.05	0.25	0.05	0.20	0.15	0.00	20	70 <sup>a</sup>

<sup>a</sup>This is an example of table footnote

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### 3.1 Feature extraction using DCPCA

Four score and seven years ago our fathers brought forth, upon this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal.

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But in a larger sense we can not dedicate – we can not consecrate – we can not hallow this ground. The brave men, living and dead, who struggled, here, have consecrated it far above our poor power to add or detract. The world will little note, nor long remember, what we say here, but can never forget what they did here. It is for us, the living, rather to be dedicated here to the unfinished work which they have, thus far, so nobly carried and that this government of the people, by the people, for the people, shall not perish from the earth Figure 2.

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**Figure 1.** This is an example of figure caption.

nobly carried on. It is rather for us to be here dedicated to the great task remaining before us that from these honoured dead we take increased devotion to that cause for which they here gave the last full measure of devotion that we here highly resolve that these dead shall not have died in vain; that this nation shall have a new birth of freedom; and that this government of the people, by the people, for the people, shall not perish from the earth Figure 2.

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**Figure 2.** It is rather for us to be here dedicated to the great task remaining before us that from these honoured dead we take increased devotion to that cause for which  $x^{(0)} = x_1$  and  $x^{(0)} = x_2$ , where  $x_1 = (\frac{1}{\sqrt{3,522}}, \dots, \frac{1}{\sqrt{3,522}})^T$  and  $x_2 = (\frac{1}{\sqrt{1,000}}, \dots, \frac{1}{\sqrt{1,000}}, 0, \dots, 0)^T$ . they here gave the last full measure of devotion that we here highly resolve that these dead shall not have died in vain; that this nation shall have a new birth of freedom; and that this government of the people, by the people, for the people, shall not perish from the earth  $(x^{(0)})^T x^{(0)} = 1$ .

#### 4 DISCUSSION

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#### 5 CONCLUSION

Four score and seven years ago our fathers brought forth, upon this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal.

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#### 6 ACKNOWLEDGEMENTS

This is a multiline text of acknowledgments. We are met here on a great battlefield of that war. We have come to dedicate

a portion of it as a final resting place for those who here gave their lives that that nation might live.

#### A AN EXAMPLE OF APPENDIX HEAD

Consider a data set

$$S = (f_{ij})_{m \times n} \quad (6)$$

the  $i$ th data point of which is

$$(f_{i1}, \dots, f_{in}).$$

Let  $\bar{f}_q = \frac{1}{m} \sum_{i=1}^m f_{iq}$  and  $\sigma_q$  The brave men, living and dead, who struggled, here, have consecrated it far above our poor power to add or detract. Suppose that

$$X_i = (x_{i1}, \dots, x_{in}) \quad (i = 1, \dots, m),$$

where  $x_{ij} = (f_{ij} - \bar{f}_j) / \sigma_j$  and

$$B = (X_1^T, \dots, X_m^T)^T.$$

Then we can show that

$$C = B^T B = \sum_{i=1}^m X_i^T X_i = (C_{jk})_{n \times n},$$

where  $C_{jk} = \sum_{i=1}^m x_{ij} x_{ik}$  is the correlation matrix. Our goal is to find a normalized vector

$$a_1 = (a_{11}, a_{12}, \dots, a_{1n})^T$$

such that the projection of the standardized data

$$X_i a_1 = \sum_{k=1}^n x_{ik} a_{1k},$$

then  $B a_1$

$$a_1^T B^T B a_1 = a_1^T C a_1.$$

Our goal is to maximize this value under the constraint  $a_1^T a_1 = 1$ . Let  $\lambda_{\max}$  be the largest eigenvalue of  $C$ . According to the Rayleigh–Ritz theorem,  $a_1$  can be obtained by solving

$$Ca_1 = \lambda_{\max} a_1.$$

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