

Scientific Writing in English: Techniques and Tools



Examples Using MAZEA

Ethel Schuster, Ph.D.
Northern Essex Community College, USA
eschuster@necc.mass.edu

Ethel Schuster, Ph.D.


MAZEA for Annotation

- Tool for identification of components of abstract
- Only uses 6 of them: Background, Gap, Purpose, Methods, Results, Conclusion
- Based on machine-learning

MAZEA

- <http://www.nilc.icmc.usp.br/mazea-web/>

Using MAZEA

- 
1. Enter text (abstract)
 2. Select either
 - Life and Health Sciences OR
 - Physical Sciences and Engineering
 3. Click button “Detect Rhetorical Structure” to run
 4. Examine results

Test cases

- Let's try some examples from Part II

Case 1

Self-assembly of components larger than molecules into ordered arrays is an efficient way of preparing microstructured materials with interesting mechanical and optical properties. Although crystallization of identical particles or particles of different sizes or shapes can be readily achieved, the repertoire of methods to assemble binary lattices of particles of the same sizes but with different properties is very limited. This paper describes electrostatic self-assembly of two types of macroscopic components of identical dimensions using interactions that are generated by contact electrification. The systems we have examined comprise two kinds of objects (usually spheres) made of different polymeric materials that charge with opposite electrical polarities when agitated on flat, metallic surfaces. The interplay of repulsive interactions between like-charged objects and attractive interactions between unlike-charged ones results in the self-assembly of these objects into highly ordered, closed arrays. Remarkably, some of the assemblies that form are not electroneutral—that is, they possess a net charge. We suggest that the stability of these unusual structures can be explained by accounting for the interactions between electric dipoles that the particles in the aggregates induce in their neighbors.

G.M. Whitesides et al., *Electrostatic self-assembly of macroscopic crystals using contact electrification*, Nature Materials 2, 241-245 (2003)

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Case 1: Human Annotation

<context>Self-assembly of components larger than molecules into ordered arrays is an efficient way of preparing microstructured materials with interesting mechanical and optical properties. **</context>**

<gap> Although crystallization of identical particles or particles of different sizes or shapes can be readily achieved, the repertoire of methods to assemble binary lattices of particles of the same sizes but with different properties is very limited. **</gap>**

<purpose>This paper describes electrostatic self-assembly of two types of macroscopic components of identical dimensions using interactions that are generated by contact electrification. **</purpose>**

<method>The systems we have examined comprise two kinds of objects (usually spheres) made of different polymeric materials that charge with opposite electrical polarities when agitated on flat, metallic surfaces**</method>**

<result>The interplay of repulsive interactions between like-charged objects and attractive interactions between unlike-charged ones results in the self-assembly of these objects into highly ordered, closed arrays. Remarkably, some of the assemblies that form are not electroneutral—that is, they possess a net charge. **</result>**

<conclusion>We suggest that the stability of these unusual structures can be explained by accounting for the interactions between electric dipoles that the particles in the aggregates induce in their neighbors. **</conclusion>**

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Case 1: Using Mazea (v1)

MAZEA-Web is a multilabel rhetorical structure classifier developed to analyse English abstracts. In a nutshell, this system splits abstract sentences and label each one with one or more labels among: **background, gap, purpose, method, result, conclusion**.

Before using:

1. Files must be in the **txt format** (encoded in UTF-8)
2. Max size: 5 MB

Enter your text:

Self-assembly of components larger than molecules into ordered arrays is an efficient way of preparing microstructured materials with interesting mechanical and optical properties. Although crystallization of identical particles or particles of different sizes or shapes can be readily achieved, the repertoire of methods to assemble binary lattices of particles of the same sizes but with different properties is very limited. This paper describes electrostatic self-assembly of two types of macroscopic components of identical dimensions using interactions that are generated by contact electrification. The systems we have examined comprise two kinds of objects (usually spheres) made of different polymeric materials that charge with opposite electrical polarities when agitated on flat, metallic surfaces. The interplay of repulsive interactions between like-charged objects and attractive interactions between unlike-charged ones results in the self-assembly of these objects into highly ordered, closed arrays. Remarkably, some of the assemblies that

Upload do abstract:

Physical Sciences and Engineering

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Case 1: Mazea Annotation

Self-assembly of components larger than molecules into ordered arrays is an efficient way of preparing microstructured materials with interesting mechanical properties.

Background

Although crystallization of identical particles or particles of different sizes or shapes can be readily achieved, the repertoire of methods to assemble binary systems is very limited.

Purpose

This paper describes electrostatic self-assembly of two types of macroscopic components of identical dimensions using interactions that are generated by electric dipoles.

None

The systems we have examined comprise two kinds of objects (usually spheres) made of different polymeric materials that charge with opposite electric charges.

Method

The interplay of repulsive interactions between like-charged objects and attractive interactions between unlike-charged ones results in the self-assembly of ordered arrays.

Result

Remarkably, some of the assemblies that form are not electroneutral; that is, they possess a net charge.

Conclusion

We suggest that the stability of these unusual structures can be explained by accounting for the interactions between electric dipoles that the particles in the arrays possess.

Case 1: Using Mazea (v2)

MAZEA-Web is a multilabel rhetorical structure classifier developed to analyse English abstracts. In a nutshell, this system splits abstract sentences and label each one with one or more labels among: **background, gap, purpose, method, result, conclusion**.

Before using:

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Enter your text:

Self-assembly of components larger than molecules into ordered arrays is an efficient way of preparing microstructured materials with interesting mechanical and optical properties. Although crystallization of identical particles or particles of different sizes or shapes can be readily achieved, the repertoire of methods to assemble binary lattices of particles of the same sizes but with different properties is very limited. This paper describes electrostatic self-assembly of two types of macroscopic components of identical dimensions using interactions that are generated by contact electrification. The systems we have examined comprise two kinds of objects (usually spheres) made of different polymeric materials that charge with opposite electrical polarities when agitated on flat, metallic surfaces. The interplay of repulsive interactions between like-charged objects and attractive interactions between unlike-charged ones results in the self-assembly of these objects into highly ordered, closed arrays. Remarkably, some of the assemblies that

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Life and Health Sciences

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Case 1: Mazea Annotation

Background

Self-assembly of components larger than molecules into ordered arrays is an efficient way of preparing microstructured materials

Background

Although crystallization of identical particles or particles of different sizes or shapes can be readily achieved, the repertoire of methods is very limited.

Purpose

This paper describes electrostatic self-assembly of two types of macroscopic components of identical dimensions using interactions

None

The systems we have examined comprise two kinds of objects (usually spheres) made of different polymeric materials that charge

Method

The interplay of repulsive interactions between like-charged objects and attractive interactions between unlike-charged ones results

Result

Remarkably, some of the assemblies that form are not electroneutral???that is, they possess a net charge.

Conclusion

We suggest that the stability of these unusual structures can be explained by accounting for the interactions between electric dipoles

Case 2

A growing number of applications depend on accurate and fast 3D scene analysis. Examples are model and lightfield acquisition, collision prevention, mixed reality, and gesture recognition. The estimation of a range map by image analysis or laser scan techniques is still a time-consuming and expensive part of such systems. A lower-priced, fast and robust alternative for distance measurements are Time-of-Flight (ToF) cameras. Recently, significant improvements have been made in order to achieve low-cost and compact ToF-devices, that have the potential to revolutionize many fields of research, including Computer Graphics, Computer Vision and Man Machine Interaction (MMI). These technologies are starting to have an impact on research and commercial applications. The upcoming generation of ToF sensors, however, will be even more powerful and will have the potential to become “ubiquitous real-time geometry devices” for gaming, web-conferencing, and numerous other applications. This STAR gives an account of recent developments in ToF-technology and discusses the current state of the integration of this technology into various graphics-related applications

Kolb, Andreas, et al. "Time-of-flight sensors in computer graphics." *Proc. Eurographics (State-of-the-Art Report)*. 2009.

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Case 2: Using Mazea

MAZEA-Web *(beta)*

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Detect rhetorical structure

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Case 2: Mazea Annotation

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Google

Background

A growing number of applications depend on accurate and fast 3D scene analysis.

Gap

Examples are model and light field acquisition, collision prevention, mixed reality, and gesture recognition.

Method

The estimation of a range map by image analysis or laser scan techniques is still a time-consuming and expensive part of such systems.

Method

A lower-priced, fast and robust alternative for distance measurements are Time-of-Flight (ToF) cameras.

Background

Recently, significant improvements have been made in order to achieve low-cost and compact ToF-devices, that have the potential to revolutionize many fields of research, including Computer Graphics, Computer Vision and Man Machine Interaction (MMI).

Background

These technologies are starting to have an impact on research and commercial applications.

Background

The upcoming generation of ToF sensors, however, will be even more powerful and will have the potential to become ubiquitous real-time geometry devices for gaming, web-conferencing, and numerous other applications.

Background, Method

This STAR gives an account of recent developments in ToF-technology and discusses the current state of the integration of this technology into various graphics-related applications

Case 3

Dendrimers are branched, synthetic polymers with layered architectures that show promise in several biomedical applications. By regulating dendrimer synthesis, it is possible to precisely manipulate both their molecular weight and chemical composition, thereby allowing predictable tuning of their biocompatibility and pharmacokinetics. Advances in our understanding of the role of molecular weight and architecture on the *in vivo* behavior of dendrimers, together with recent progress in the design of biodegradable chemistries, has enabled the application of these branched polymers as anti-viral drugs, tissue repair scaffolds, targeted carriers of chemotherapeutics and optical oxygen sensors. Before such products can reach the market, however, the field must not only address the cost of manufacture and quality control of pharmaceutical-grade materials, but also assess the long-term human and environmental health consequences of dendrimer exposure *in vivo*.

Lee C. C., *et al.*, *Designing dendrimers for biological applications*, Nature Biotechnology 23, 1517 – 1526 (2005) (Review)

Case 3: Human Annotation

`<context>`Dendrimers are branched, synthetic polymers with layered architectures that show promise in several biomedical applications. By regulating dendrimer synthesis, it is possible to precisely manipulate both their molecular weight and chemical composition, thereby allowing predictable tuning of their biocompatibility and pharmacokinetics. Advances in our understanding of the role of molecular weight and architecture on the *in vivo* behavior of dendrimers, together with recent progress in the design of biodegradable chemistries, has enabled the application of these branched polymers as anti-viral drugs, tissue repair scaffolds, targeted carriers of chemotherapeutics and optical oxygen sensors.`</context>`

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`</gap>`

Case 3: Using Mazea

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Google

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Case 3: Mazea Annotation



Result

Dendrimers are branched, synthetic polymers with layered architectures that show promise in several biomedical applications.

Result

By regulating dendrimer synthesis, it is possible to precisely manipulate both their molecular weight and chemical composition, thereby allowing predictable tuning of their biocompatibility and pharmacokinetics.

Background

Advances in our understanding of the role of molecular weight and architecture on the in vivo behavior of dendrimers, together with recent progress in the design of biodegradable chemistries, has enabled the application of these branched polymers as anti-viral drugs, tissue repair scaffolds, targeted carriers of chemotherapeutics and optical oxygen sensors.

Background

Before such products can reach the market, however, the field must not only address the cost of manufacture and quality control of pharmaceutical-grade materials, but also assess the long-term human and environmental health consequences of dendrimer exposure in vivo.



Case 4: Original

Validity of the computer scienc...



europemc.org/abstract/MED/9565947/reload=0;jsessionid=xBfQtwARLjKrrXUZoSbe.8

Validity of the computer science and applications (CSA) activity monitor in children.

(PMID:9565947)

Abstract

Citations 

BioEntities 

Related Articles 

Trost SG, Ward DS, Moorehead SM, Watson PD, Riner W, Burke JR
Department of Exercise Science, University of South Carolina, Columbia, USA.
Medicine and Science in Sports and Exercise [1998, 30(4):629-633]

Type: Journal Article
DOI: 10.1097/00005768-199804000-00023 

Abstract

Highlight Terms 

[Chemicals\(1\)](#)

PURPOSE: The purpose of this study was to evaluate the validity of the CSA activity monitor as a measure of children's physical activity using energy expenditure (EE) as a criterion measure.

METHODS: Thirty subjects aged 10 to 14 performed three 5-min treadmill bouts at 3, 4, and 6 mph, respectively. While on the treadmill, subjects wore CSA (WAM 7164) activity monitors on the right and left hips. VO₂ was monitored continuously by an automated system. EE was determined by multiplying the average VO₂ by the caloric equivalent of the mean respiratory exchange ratio.

RESULTS: Repeated measures ANOVA indicated that both CSA monitors were sensitive to changes in treadmill speed. Mean activity counts from each CSA unit were not significantly different and the intraclass reliability coefficient for the two CSA units across all speeds was 0.87. Activity counts from both CSA units were strongly correlated with EE ($r = 0.86$ and 0.87 , $P < 0.001$). An EE prediction equation was developed from 20 randomly selected subjects and cross-validated on the remaining 10. The equation predicted mean EE within 0.01 kcal.min⁻¹. The correlation between actual and predicted values was 0.93 ($P < 0.01$) and the SEE was 0.93 kcal.min⁻¹.

CONCLUSION: These data indicate that the CSA monitor is a valid and reliable tool for quantifying treadmill walking and running in children.



Case 4: Using Mazea

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Google

MAZEA-Web *(beta)*

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Case 4: Mazea Annotation

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Purpose

The purpose of this study was to evaluate the validity of the CSA activity monitor as a measure of children's physical activity using energy expenditure (EE) as a criterion measure.

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Method

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Method

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Method

EE was determined by multiplying the average VO₂ by the caloric equivalent of the mean respiratory exchange ratio.

Method

Repeated measures ANOVA indicated that both CSA monitors were sensitive to changes in treadmill speed.

Result

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Result

Activity counts from both CSA units were strongly correlated with EE ($r = 0.86$ and 0.87 , $P < 0.001$).

Method

An EE prediction equation was developed from 20 randomly selected subjects and cross-validated on the remaining 10.

Result

The equation predicted mean EE within 0.01 kcal.min⁻¹.

Result

The correlation between actual and predicted values was 0.93 ($P < 0.01$) and the SEE was 0.93 kcal.min⁻¹.

Conclusion

These data indicate that the CSA monitor is a valid and reliable tool for quantifying treadmill walking and running in children.

Closing Remarks

- **Mazea: Machine learning**
- **May yield differ in annotation**
- **Help? Compare annotation**
 - **Human**
 - **Automatic (machine)**

Change your own?