

## **BAB VI**

### **KESIMPULAN DAN SARAN**

#### **1. Kesimpulan**

Penelitian ini membuktikan bahwa pendekatan *feature-point* dengan algoritma *nearest neighbor* dapat menyederhanakan proses secara otomatis dan sistematis untuk mengetahui bobot area gerak atau area kelompok vertek yang terpengaruh oleh pergerakan centroid. Hasil penelitian ini yang menentukan area terpengaruh gerakan menggunakan perhitungan jarak minimal dalam wajah 3D menggunakan formula *great circle distance haversine* dibandingkan dengan penelitian terdahulu yang dalam menentukan jarak antara vertek dengan centroid yang dilakukan dengan euklidian ternyata memiliki kecenderungan yang sama, yaitu trend data keanggotan vertek pada tiap feature point-nya berupa grafik yang naik.

#### **2. Saran**

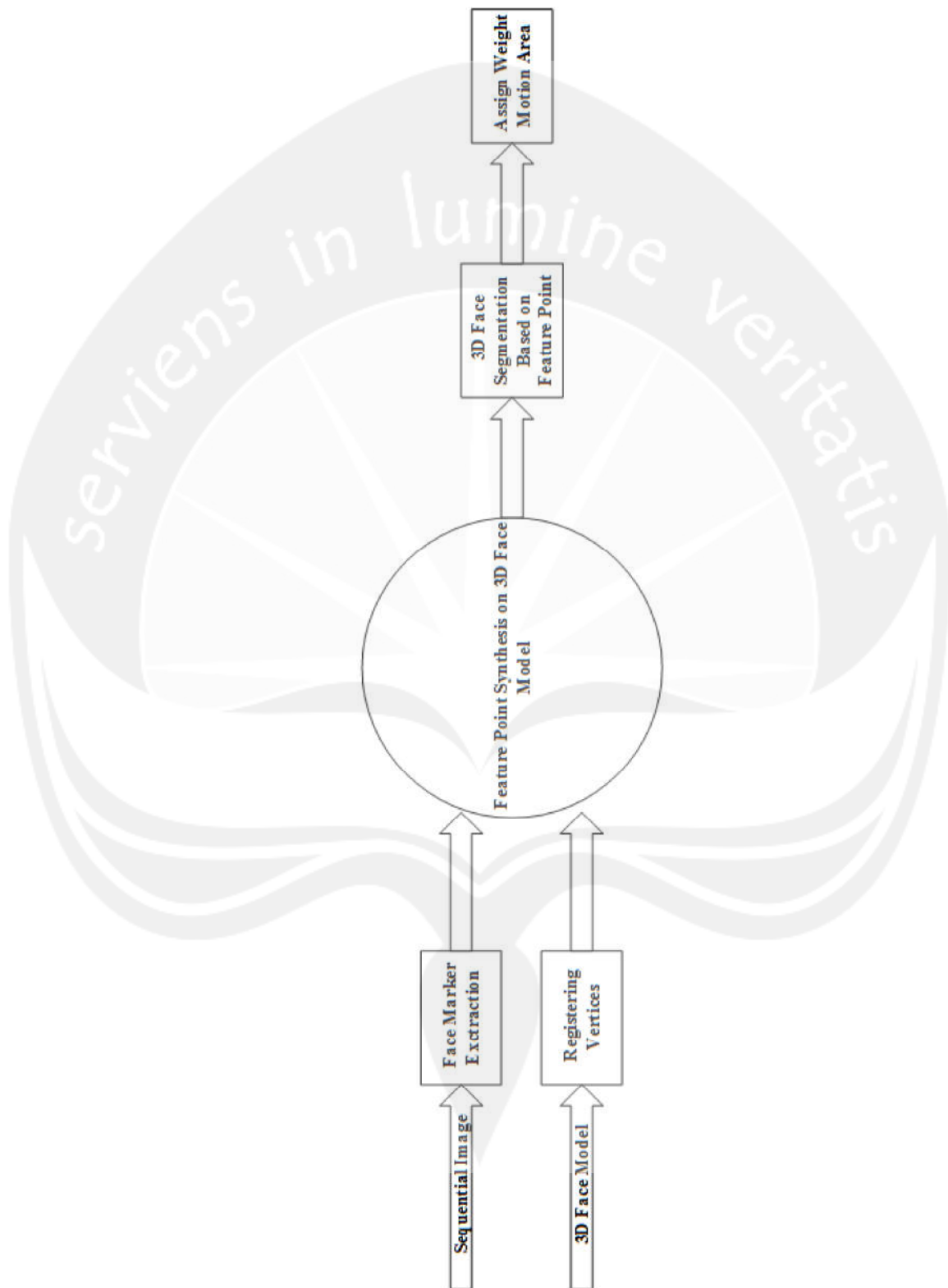
Walaupun proses klastering ini dapat bekerja dengan baik dengan model wajah 3D, performa dalam penelitian ini masih dapat ditingkatkan dan dites dengan model wajah yang lain seperti wajah karakter kartun untuk mendapatkan hasil yang lebih mendetail untuk segmentasi otomatis menggunakan feature point atau marker.

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**LAMPIRAN**

**Lampiran 1 Data Flow Diagram**

Lampiran 2 Sertifikat Seminar Internasional



### Lampiran 3 Terindeks IEEE Xplore

The screenshot shows the IEEE Xplore Digital Library search results page. At the top, there is a navigation bar with links for 'IEEE.org', 'IEEE Xplore Digital Library', 'IEEE-SA', 'IEEE Spectrum', 'More Sites', 'Cart (0)', 'Create Account', and 'Personal Sign In'. The IEEE logo is prominently displayed on the left. Below the navigation bar, there are tabs for 'BROWSE', 'MY SETTINGS', 'GET HELP', 'WHAT CAN I ACCESS?', and 'SUBSCRIBE'. A search bar contains the text 'rio caesar', and a search button is visible. Below the search bar, there are tabs for 'Basic Search', 'Author Search', and 'Publication Search'. The search results section displays 'Displaying 1 of 1 result for "Authors": caesar, rio "First Name": rio "Last Name": caesar'. A checkbox for 'Select All on Page' is present. The search result is a paper titled 'An automatic 3D face model segmentation for acquiring weight motion area' by Rio Caesar, Suyoto, and Samuel Gandang Gunanto, published in the '2016 1st International Conference on Information Technology, Information Systems and Electrical Engineering (ICITISEE) Year: 2016'. The paper has 81 pages and a DOI of 10.1109/ICITISEE.2016.7803052. The result is categorized as an 'IEEE Conference Publications' and is available as an 'Abstract' (704 Kb). A 'Full-Text' button is also visible, with a link to 'REQUEST A FREE TRIAL'. The IEEE logo is also present in the bottom right corner.

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Displaying 1 of 1 result for "Authors": caesar, rio "First Name": rio "Last Name": caesar

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**An automatic 3D face model segmentation for acquiring weight motion area**  
 Rio Caesar, Suyoto, Samuel Gandang Gunanto  
 2016 1st International Conference on Information Technology, Information Systems and Electrical Engineering (ICITISEE) Year: 2016  
 Pages: 81 - 86, DOI: 10.1109/ICITISEE.2016.7803052  
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## Lampiran 4 EDAS Home

EDAS

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### EDAS Conference and Journal Management System

Click on the menu items above to submit and review papers.

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Only papers for upcoming conferences and journal issues are shown.

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**My profile**

Name	Mr. Rio Caesar
EDAS identifier	1412155
Type (gender)	student (M)
Affiliation	Magister Informatics Engineering Alma Jaya Yogyakarta University Indonesia
Email	155302365@students.uajy.ac.id
Alternate email address	rio.caesar88@gmail.com
Bio	currently work as lecturer for game development in Indonesian Institute of the Arts and still attendance in post graduate Alma Jaya Yogyakarta University
Conflicts of interest	25  last updated January 17, 2017 01:31:35 America/New_York

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EDAS #17230-1221 Tue, 17 Jan 2017 01:31:35:000 EDT; user=1412155 using Wins 11 Chrome 55.0 chrome 5.0360.032.0; browser=ms



## Lampiran 5 EDAS Paper

The screenshot displays the EDAS (Electronic Document Analysis System) interface. At the top, a navigation menu includes links for Home, Submit paper, Travel grants, Register, My..., and Help. Below this, a section titled "Conferences containing my papers" contains a warning: "All papers from conferences are shown, but you can also restrict this to conferences that have not ended. Dates listed are deadlines for submitting manuscripts for registered papers. You can only upload papers that have at least one author." Below the warning is a table with the following columns: Paper title (details), Status, Edit, Add and delete authors, Withdraw, Suspend, Copyright, and Final manuscript. The table contains one entry: "ICTIBEE 2016 An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area", with a status of "Accepted". At the bottom of the page, a small footer indicates the browser and system information: "EDAS at 172.30.1.223/706, 17 Jan 2017 09:33:38 -0500 (EST) using AppleWebKit/537.36 (KHTML, like Gecko) Chrome/55.0.2800.80 Safari/537.36".

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All papers from conferences are shown, but you can also restrict this to conferences that have not ended. Dates listed are deadlines for submitting manuscripts for registered papers. You can only upload papers that have at least one author.

Paper title (details)	Status	Edit	Add and delete authors	Withdraw	Suspend	Copyright	Final manuscript
ICTIBEE 2016 An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area	Accepted						

EDAS at 172.30.1.223/706, 17 Jan 2017 09:33:38 -0500 (EST) using AppleWebKit/537.36 (KHTML, like Gecko) Chrome/55.0.2800.80 Safari/537.36

## Lampiran 6 EDAS Kritik

Home Register My... Help

ICITISEE 2018

# (1570286575): An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area

bib

Property	Change	Add	Value																														
Conference and track			2016 1st International Conference on Information Technology, Information Systems and Electrical Engineering (ICITISEE) - Information Technology																														
Authors	Only the chairs (icitee@icitee.info) can edit		<table border="1"> <thead> <tr> <th>Name</th> <th>ID</th> <th>Edit</th> <th>Flag</th> <th>Affiliation (edit for paper)</th> <th>Email</th> <th>Country</th> </tr> </thead> <tbody> <tr> <td>Rio Caesar</td> <td>1412155</td> <td></td> <td></td> <td>Atma Jaya Yogyakarta University</td> <td>155302365@students.ujay.ac.id</td> <td>Indonesia</td> </tr> <tr> <td>Suyolo Suyolo</td> <td>1193485</td> <td></td> <td></td> <td>Universitas Atma Jaya Yogyakarta</td> <td>suyolo@mail.ujay.ac.id</td> <td>Indonesia</td> </tr> <tr> <td>Samuel Gandang Gunanto</td> <td>1368522</td> <td></td> <td></td> <td>Indonesian Institute of The Arts Yogyakarta &amp; Faculty of Recorded Media Arts</td> <td>gandang@isi.ac.id</td> <td>Indonesia</td> </tr> </tbody> </table>	Name	ID	Edit	Flag	Affiliation (edit for paper)	Email	Country	Rio Caesar	1412155			Atma Jaya Yogyakarta University	155302365@students.ujay.ac.id	Indonesia	Suyolo Suyolo	1193485			Universitas Atma Jaya Yogyakarta	suyolo@mail.ujay.ac.id	Indonesia	Samuel Gandang Gunanto	1368522			Indonesian Institute of The Arts Yogyakarta & Faculty of Recorded Media Arts	gandang@isi.ac.id	Indonesia		
Name	ID	Edit	Flag	Affiliation (edit for paper)	Email	Country																											
Rio Caesar	1412155			Atma Jaya Yogyakarta University	155302365@students.ujay.ac.id	Indonesia																											
Suyolo Suyolo	1193485			Universitas Atma Jaya Yogyakarta	suyolo@mail.ujay.ac.id	Indonesia																											
Samuel Gandang Gunanto	1368522			Indonesian Institute of The Arts Yogyakarta & Faculty of Recorded Media Arts	gandang@isi.ac.id	Indonesia																											
Title	Only the chairs (icitee@icitee.info) can edit		An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area																														
Abstract	Only the chairs (icitee@icitee.info) can edit		Detailed facial animation needs always need some time to do and in the process it still depends on the skill of the animator. For that reason this research propose method for using motion capture marker data in 3D face model for automatically segment weight motion area based on the feature point, and for the process of data grouping will be calculate with nearest neighbor method based on the distance value that acquired from spherical coordinates of the 3D face model. The result from the method that used to calculate the distance between feature point and vertex that form 3D face model in this research will show the weight motion area that generated automatically from the feature point based on nearest neighbor algorithm.																														
Keywords	Only the chairs (icitee@icitee.info) can edit		facial animation; segmentation; weight motion area; nearest neighbor; feature point																														
Presenters			Rio Caesar (bio)																														
Registration			Rio Caesar has registered and paid for Local Bank Transfer ICITISEE Participants																														
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Reviews

3 Reviews

Review 1 (Reviewer C)

Relevance and timeliness	Technical content and scientific rigour	Novelty and originality	Quality of presentation	Recommendation
Average (3)	Average (3)	Average (3)	Poor (1)	Possible Accept (2)

Detailed comments (Please justify your recommendation and suggest improvements in technical content or presentation.)

The 3d face model segmentation idea of the work is good, but implementation, contribution not strong enough. Also, the writing is very poor, and at times, looks pounds measure.

Review 2 (Reviewer K)

Relevance and timeliness	Technical content and scientific rigour	Novelty and originality	Quality of presentation	Recommendation
Excellent (5)	Average (3)	Average (3)	Average (3)	Accept (3)

Detailed comments (Please justify your recommendation and suggest improvements in technical content or presentation.)

Paper need to detail the look or algorithm for process of clustering and segmentation.

Review 3 (Reviewer P)

Relevance and timeliness	Technical content and scientific rigour	Novelty and originality	Quality of presentation	Recommendation
Good (4)	Average (3)	Average (3)	Below Average (2)	Possible Accept (2)

Detailed comments (Please justify your recommendation and suggest improvements in technical content or presentation.)

The paper substantially written with notations and results. However, the presentation is weak, in terms of language and syntax. Rewrite the abstract by clearly stating the problem addressed in the paper and the proposed solution.

1. Replace STATE OF THE ART with RELATED WORK, besides remove subsections from this part. Please follow the standards.
2. Rewrite of the Figures.
3. Language mistakes are clarity.

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### Lampiran 7 Alur Waktu EDAS

The screenshot shows the Outlook interface with the following elements:

- Top Bar:** Office 365, Outlook, Search Mail and People (8), and navigation icons.
- Left Navigation Pane:** Folders (Inbox, Clutter, Sent Items, Drafts, **EDAS**, More), Groups (New), and a search bar.
- Message List:** A list of 10 messages in the 'EDAS' folder, all with the subject '[ICITISEE 2016] #1570286575 has been uploaded • Dear Mr. Rio Caesar: Thank you for uploading yo...'. The dates are: 9/7/2016, 9/7/2016, 9/7/2016, 7/17/2016, 7/17/2016, 6/30/2016, 5/30/2016, 5/30/2016, 5/30/2016, and 5/30/2016.
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## Lampiran 8 EDAS Registrasi

[ICITISEE 2016] Paper 1570286575 has been registered



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Mon 5/30/2016, 10:58 PM

Rio Caesar

Dear Mr. Rio Caesar:

Thank you for registering your paper 1570286575 (*An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area*) to **International Conference on Information Technology, Information Systems and Electrical Engineering 2016**. You still have to upload your manuscript at <https://edas.info/uploadPaper.php?m=1570286575>. Your manuscript can be application/pdf, application/msword and application/vnd.openxmlformats-officedocument.wordprocessingml.document.

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Regards, The conference chairs



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## Lampiran 9 EDAS Perubahan Informasi 1

The screenshot shows an Outlook email window. The left sidebar displays the 'Office 365' logo and navigation options like 'Search Mail and People', 'Folders', 'Inbox', 'Clutter', 'Sent Items', 'Drafts', and 'EDAS'. The main content area shows an email from 'EDAS Conference Manager <help@edas-help.com>' on behalf of 'ICITISEE 2016'. The subject is '[ICITISEE 2016] Information about paper #1570286575 (An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area) has been changed'. The email body contains the following text:

Dear Mr. Rio Caesar:  
 Information about your paper #1570286575 (An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area) for ICITISEE 2016 was changed by Rio Caesar. (0: Siyoto Siyoto added as author  
 No further action is required from you.  
 If you have already submitted your manuscript, you can change it at any time before the deadline, by following the instructions below:

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## Lampiran 10 EDAS Perubahan Informasi 2

The screenshot shows an Outlook email window. The subject line is "[ICITISEE 2016] Information about paper #1570286575 (An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area) has been changed". The sender is "EDAS Conference Manager <help@edas-help.com> on behalf of ICITISEE 2016". The email content is as follows:

Dear Mr. Rio Caesar:  
 Information about your paper #1570286575 (An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area) for ICITISEE 2016 was changed by Rio Caesar O:  
 Samuel Gandang Gunanto added as author  
 No further action is required from you.  
 If you have already submitted your manuscript, you can change it at any time before the deadline, by following the instructions below:

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### Lampiran 11 EDAS Bukti Kirim Paper

The screenshot displays an Outlook email window. The top navigation bar includes 'Office 365' and 'Outlook'. The left sidebar shows the 'Folders' pane with 'Inbox' selected. The main content area shows an email from 'EDAS Conference Manager' with the subject '[ICITISEE 2016] #1570286575 has been uploaded'. The email body contains the following text:

Dear Mr. Rio Caesar,

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Regards,  
The conference chairs

The interface also shows a search bar at the top, a toolbar with 'New', 'Delete', 'Archive', 'Junk', 'Sweep', 'Move to', and 'Categories' options, and a bottom status bar with 'Office 365' and 'Outlook' labels.

## Lampiran 12 Edas Kritik

The screenshot shows an Outlook email window. The email content is a critique of a paper titled "FACEBOOK'S REALITY CHECK: AN ALGORITHMIC FACED-BASED SEGMENTATION FOR ADVERTISING". The critique is structured as a list of numbered points (1-15) and includes a "References" section at the bottom. A large watermark is overlaid on the page, reading "serviens in lumine veritatis".

**Date:** 10.10.2023

**From:** [Redacted]

**Subject:** FACEBOOK'S REALITY CHECK: AN ALGORITHMIC FACED-BASED SEGMENTATION FOR ADVERTISING

1. The paper's title is somewhat vague and does not clearly state the main contribution of the research.

2. The abstract is too long and contains too much detail, making it difficult to read.

3. The introduction is too long and contains too much detail, making it difficult to read.

4. The paper's contribution is not clearly stated in the abstract and introduction.

5. The paper's contribution is not clearly stated in the abstract and introduction.

6. The paper's contribution is not clearly stated in the abstract and introduction.

7. The paper's contribution is not clearly stated in the abstract and introduction.

8. The paper's contribution is not clearly stated in the abstract and introduction.

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11. The paper's contribution is not clearly stated in the abstract and introduction.

12. The paper's contribution is not clearly stated in the abstract and introduction.

13. The paper's contribution is not clearly stated in the abstract and introduction.

14. The paper's contribution is not clearly stated in the abstract and introduction.

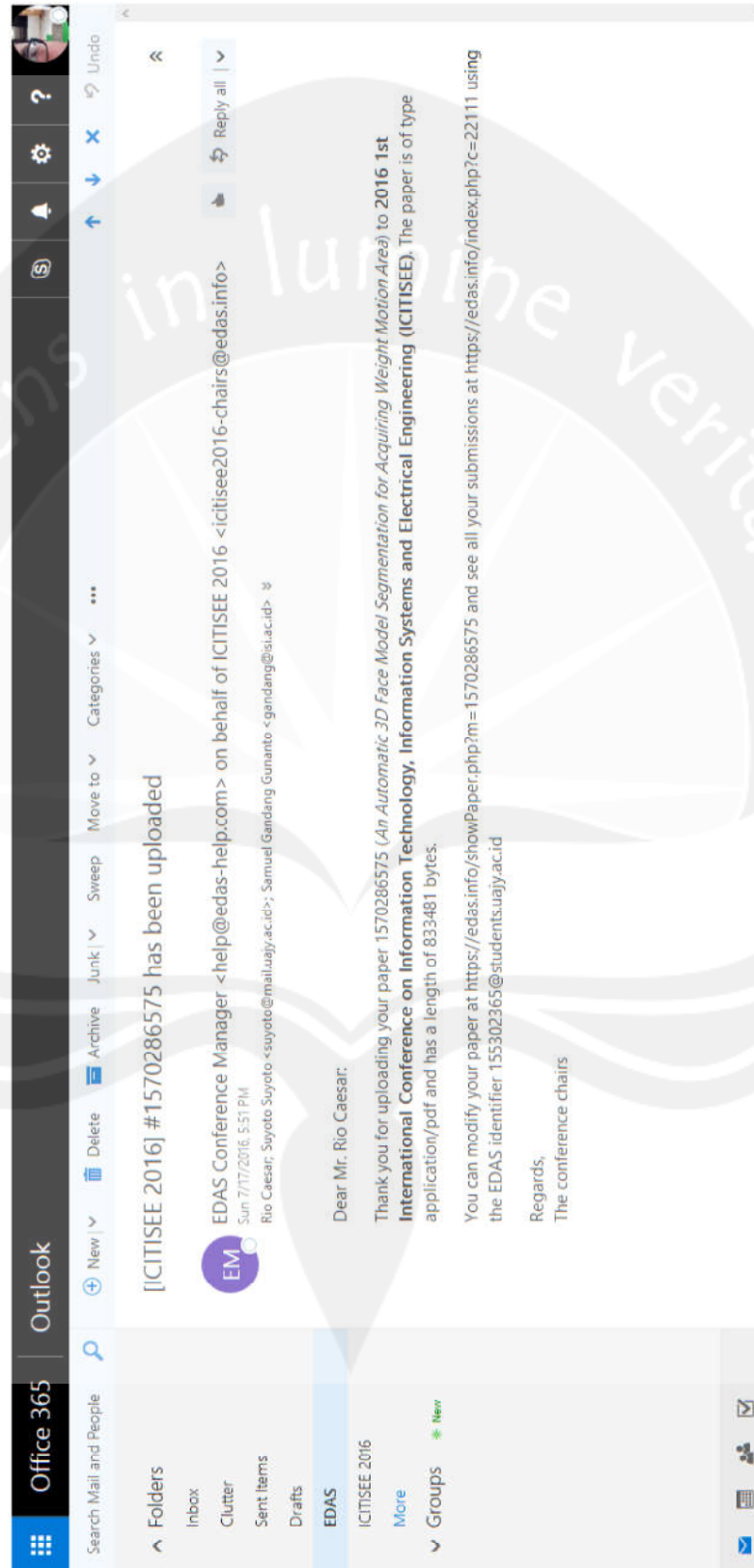
15. The paper's contribution is not clearly stated in the abstract and introduction.

**References:**

[Redacted]



### Lampiran 13 Bukti Kirim Paper Setelah Kritik



### Lampiran 14 Perubahan Informasi 3

The screenshot shows an Outlook email window. The interface includes a top navigation bar with 'Office 365' and 'Outlook' labels, and a search bar. The left sidebar shows folders like 'Inbox', 'Clutter', 'Sent Items', 'Drafts', and 'EDAS'. The main content area displays an email from 'EDAS Conference Manager' with the subject '[ICTITSEE 2016] Information about paper #1570286575 (An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area) has been changed'. The email body contains the following text:

Dear Mr. Rio Caesar:  
 Information about your paper #1570286575 (An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area) for ICTITSEE 2016 was changed by Rio Caesar (creator, author):  
 Rio Caesar is presenting the paper  
 No further action is required from you.  
 If you have already submitted your manuscript, you can change it at any time before the deadline, by following the instructions below:

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Regards, The conference chairs

### Lampiran 15 EDAS Copyrights

The screenshot shows an Outlook interface with the following elements:

- Top Bar:** Office 365, Outlook, Search Mail and People, and navigation icons (New, Delete, Archive, Junk, Sweep, Move to, Categories, Undo).
- Left Navigation Panel:** Folders (Inbox, Clutter, Sent Items, Drafts), EDAS, ICITISEE 2016, More, and Groups (marked as New).
- Message Header:**
  - Subject: [ICITISEE 2016] Your paper #1570286575 (An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area)
  - From: EDAS Conference Manager <help@edas-help.com> on behalf of rezakusuma30@gmail.com
  - Date: Wed 9/7/2016, 2:59 PM
- Message Body:**

Dear authors:

Please fill the Copyright form and resubmit your final manuscript, because you didn't use the PDF eXpress. We have already contact the PDF eXpress administrator to extend the deadline, please check everyday or we will inform you if the PDF eXpress has been extended. We are on progress stamping the final manuscript via EDAS to be sent to IEEE.

We can't sent whole accepted paper to IEEE yet before all of the author finished the administration requirements. Your fast respond is really helped us. Thank you,

Regards,  
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## Lampiran 16 EDAS *Error Copyrights*

The screenshot shows an Outlook email window. The left sidebar contains the 'Office 365' logo and a navigation pane with 'Folders' (Inbox, Clutter, Sent Items, Drafts, EDAS, ICITISEE 2016, More) and 'Groups' (New). The main pane displays an email from 'EDAS Conference Manager <help@edas-help.com>' on behalf of 'ICITISEE 2016 <icitisee2016-chairs@edas.info>' dated Wednesday, 9/7/2016, 2:59 PM. The subject is '[ICITISEE 2016] The manuscript for paper 'An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area' has problems'. The email body contains the following text:

Dear Mr. Caesar:

When processing your ICITISEE 2016 paper #1570286575, entitled "An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area", we found one or more manuscript problems:

- not certified The PDF file has not been certified by PDF eXpress.
- not embedded One or more `/showManuscript.php?m=1570286575&type=fontis` fonts are not embedded. See [EDAS FAQ](#).

Could you please check the format of your submission and resubmit the paper to within 24 hours?

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The conference chairs ICITISEE 2016

### Lampiran 17 Paper Diterima

The screenshot shows the Outlook interface with the following elements:

- Top Bar:** Office 365, Outlook, Search Mail and People, and navigation icons (New, Delete, Archive, Junk, Sweep, Move to, Categories, Undo).
- Left Navigation Panel:** Folders (Inbox, Clutter, Sent Items, Drafts), EDAS, ICITISEE 2016, More, Groups (New), and a bottom bar with icons for mail, calendar, and tasks.
- Email Subject:** [ICITISEE 2016] #1570286575 has been uploaded
- Sender:** EDAS Conference Manager <help@edas-help.com> on behalf of ICITISEE 2016 - <icitisee2016-chairs@edas.info> (EM icon, Wed 9/7/2016, 8:31 PM)
- Body Text:**

Dear Mr. Rio Caesar:

Thank you for uploading your paper 1570286575 (*An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area*) to 2016 1st International Conference on Information Technology, Information Systems and Electrical Engineering (ICITISEE). The paper is of type application/pdf and has a length of 732278 bytes.

You can modify your paper at <https://edas.info/showPaper.php?m=1570286575> and see all your submissions at <https://edas.info/index.php?c=22111> using the EDAS identifier 155302365@students.uajy.ac.id

Regards,  
The conference chairs

## Lampiran 18 Alur Waktu ICITISEE

The screenshot displays the Microsoft Outlook interface. The top navigation bar includes 'Office 365', 'Outlook', and a search icon. Below this, there are icons for 'Search Mail and People', 'New', 'Reply all', 'Delete', 'Archive', 'Junk', 'Sweep', 'Move to', 'Categories', and 'Undo'. The main area shows an email folder named 'ICITISEE 2016' with a sub-folder 'Older'. The email list contains several messages related to the ICITISEE 2016 conference, including announcements, copyright notices, and submission deadlines. The interface also shows a sidebar on the left with 'Folders' (Inbox, Clutter, Sent Items, Drafts, EDAS, ICITISEE 2016, More) and 'Groups' (New). The bottom right corner features icons for mail, calendar, and tasks.

Subject	Date
ICITISEE 2016 is now published in IEEE Xplore • Dear ICITISEE 2016 Participants, We are glad to inform	Mon 11:47 AM
ICITISEE 2016 Proceedings • Good morning Committe of ICITISEE. I want to download conference proce	11/29/2016
IEEE Copyright Transfer Confirmation for Article: An Automatic 3D Face Model Segmentation for Acqui	9/7/2016
ICITISEE 2016 - Keynote Speakers & Invited Guest Presentation Files • Dear ICITISEE 2016 Participants,	8/29/2016
Final Manuscript Template - Update • Dear ICITISEE 2016 Participants, Herewith we attach the latest IEE	8/3/2016
ICITISEE 2016 - Reminder of Final Manuscript Submission Deadline • Dear ICITISEE 2016 Participants, V	7/22/2016
ICITISEE 2016 : Paper Acceptance Notification • Dear Mr./Mrs. Rio Caesar Thank you for your paper su	7/16/2016

## Lampiran 19 Paper Dikirim

The screenshot shows an Outlook email window. The subject line is "ICITISEE 2016 : Paper Acceptance Notification". The sender is "ICITISEE STMIK AMIKOM Purwokerto <icitisee@amikompurwokerto.ac.id>". The email contains a PDF attachment named "IEEEErar" (4131B) and a text body with the following content:

Dear Mr./Mrs. Rio Caesar

Thank you for your paper submission to the Information Technology, Information Systems and Electrical Engineering (ICITISEE 2016). We are very pleased to inform you that your paper has been accepted by the Technical Program Committee for presentation in ICITISEE 2016.

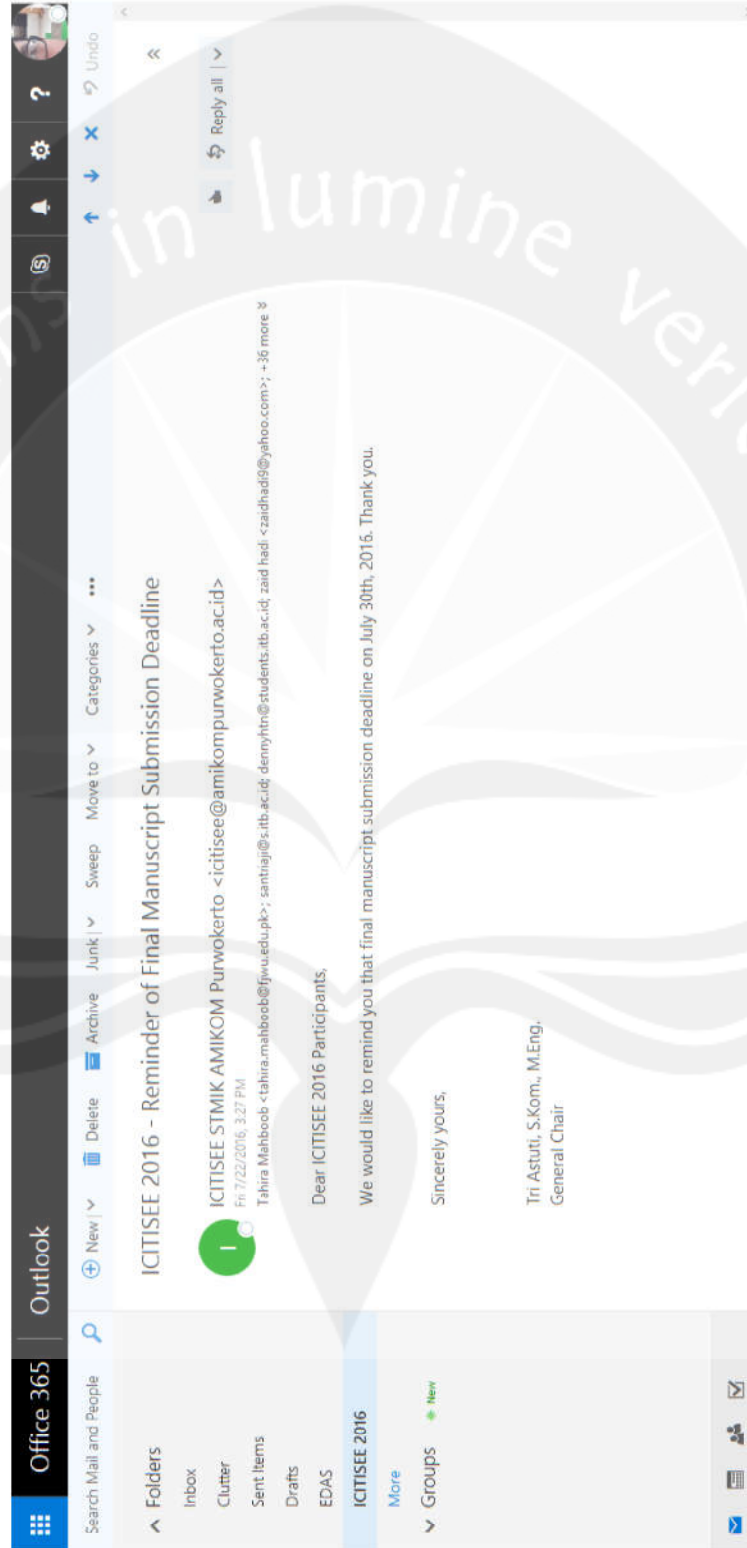
To assist your presentation at the conference, please pay careful attention to the following information:

1. Please read carefully the "notification acceptance letter" (attached) and follow the steps mentioned in the letter.
2. Please directly proceed to register your paper, which will be open from June 20th. At least one author of the accepted paper must complete the pre-registration by July 30th 2016, otherwise the paper will not be included in the conference final program book. Information about ICITISEE 2016 registration can be found <http://icbase.amikompurwokerto.ac.id/content/announcement/registrabon>
3. For information about hotel accommodation, please refer to <http://icbase.amikompurwokerto.ac.id/content/post/hotel> for the hotel booking. Since reservations and room type are available on a first come, first serve basis and are subject to room's availability upon confirmation, it is advised that the conference participants make their hotel reservations as early as possible.
4. Please note that the authors are financially responsible for registration, all of their travel arrangements, and all local expenses to attend the conference. If you have any enquiries about your paper submission or registration, please feel free to contact the ICITISEE 2016 Committee ([icitisee@amikompurwokerto.ac.id](mailto:icitisee@amikompurwokerto.ac.id)).

Again, congratulations on your paper acceptance, and we are looking forward to seeing you at ICITISEE 2016 in Yogyakarta, Indonesia.

Sincerely yours,

### Lampiran 20 ICITISEE Pengingat





Lampiran 21 *Template Paper*

The screenshot shows the Outlook interface. The left sidebar displays the 'Office 365 Outlook' header and a navigation pane with folders: 'Inbox', 'Clutter', 'Sent Items', 'Drafts', 'EDAS', and 'ICTISEE 2016'. The main pane shows an email from 'Tanira Mahboob <tanira.mahboob@jwu.edu.pk>' with the subject 'Final Manuscript Template - Update'. The email body contains the following text:

Dear ICTISEE 2016 Participants,

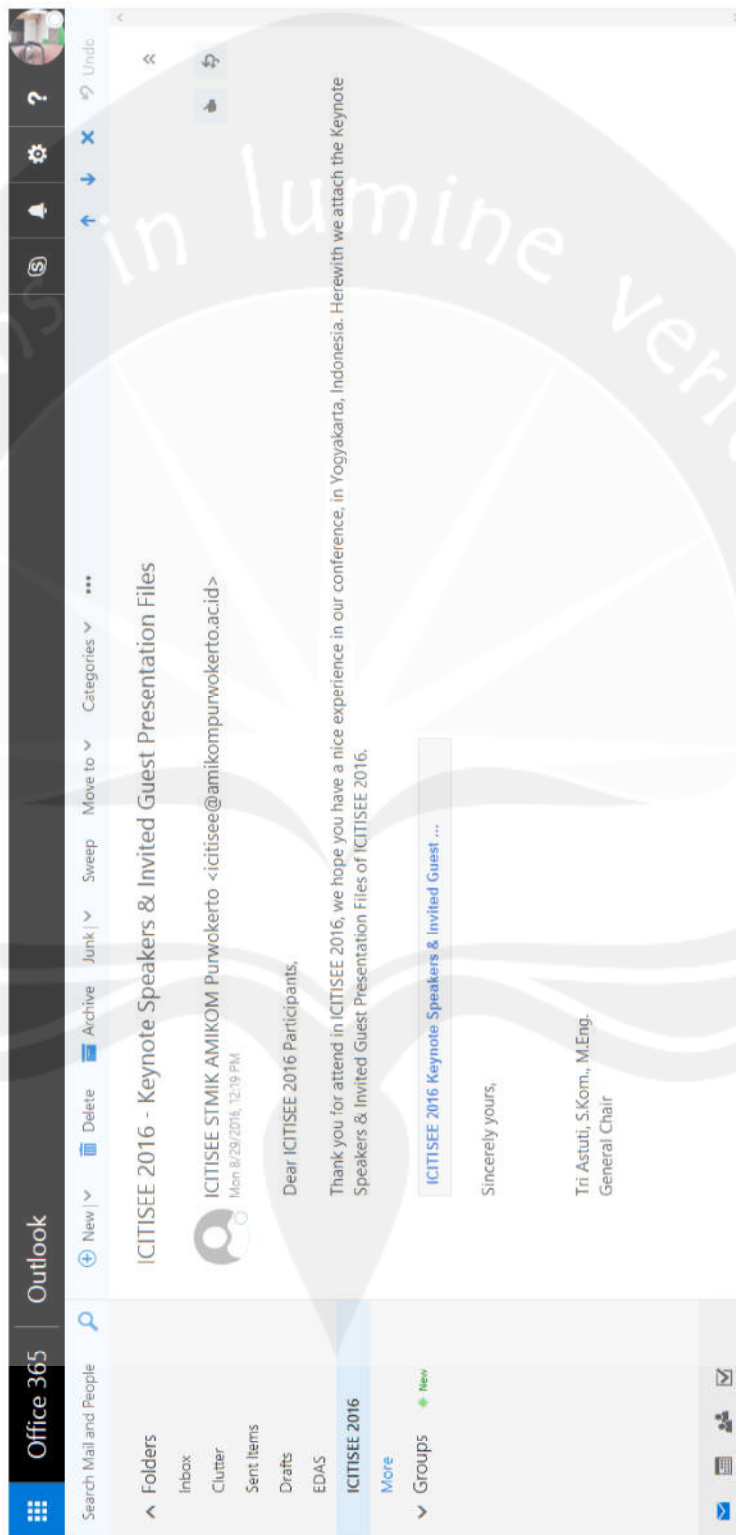
Herewith we attach the latest IEEE Paper Template, please check our attachment. If different from the format that you used, please revise and re-upload your Final Manuscript. The only difference with the first one is in the Acknowledgment and References font. Only times new roman font that used for write the paper. Please don't forget to check your Final Manuscript via PDF Xpress. We apologize for the inconvenience. Information for all author the deadline of camera ready/ final manuscript was extended until August 10, 2016. Thank you,

Sincerely yours,

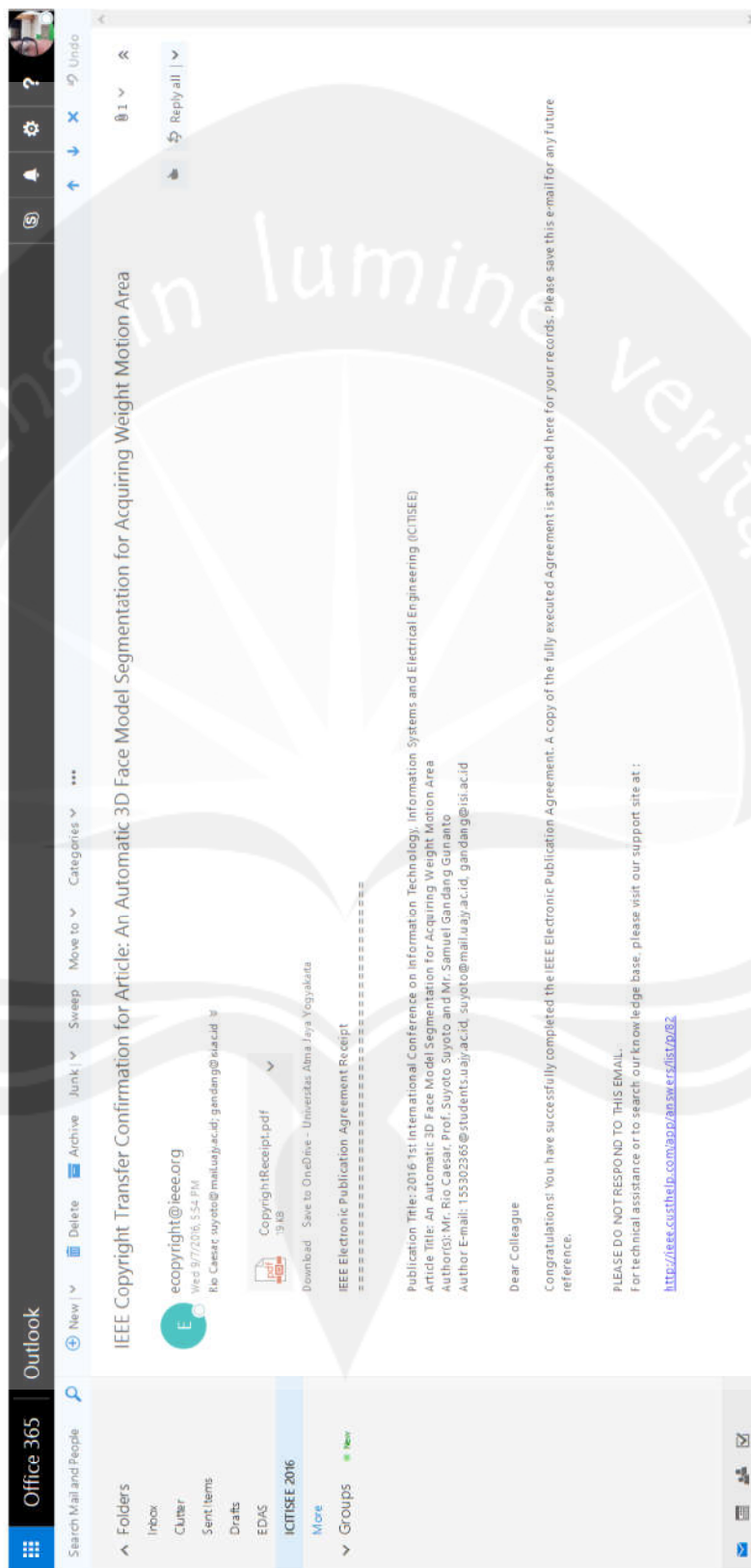
Tri Astuti, S.Kom, M.Eng.  
General Chair

The email also includes a download button for the attached file 'IEEE Paper Template - ...' (17 KB).

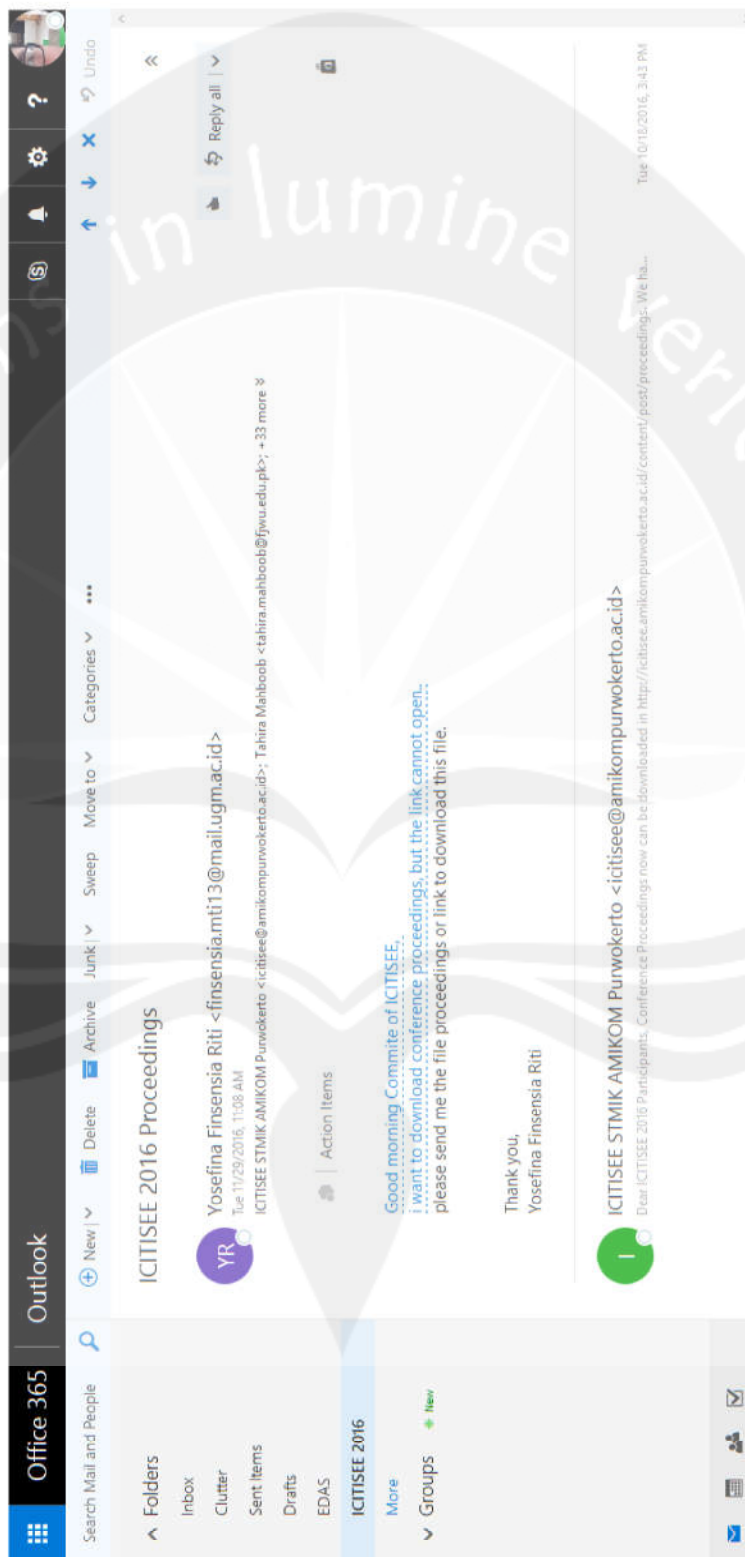
### Lampiran 22 ICITISEE Keynote



### Lampiran 23 ICITISEE Publikasi



### Lampiran 24 Download Proceeding



## Lampiran 25 ICITISEE Terindeks IEEE Xplore

The screenshot shows an Outlook email interface. The top navigation bar includes 'Office 365', 'Outlook', and various action buttons like 'New', 'Delete', 'Archive', 'Junk', 'Sweep', 'Move to', 'Categories', and 'Undo'. The left sidebar shows the 'Folders' pane with 'Inbox', 'Clutter', 'Sent Items', 'Drafts', 'EDAS', and 'ICITISEE 2016' (marked as 'New').

The main content area displays an email from 'Koushik Dutta <koushik.it.22@gmail.com>' to 'Fransiskus Panca Juniawan <fransiskus.pj@atmaluhur.ac.id>', 'robby,c@staff.gunadarma.ac.id', and '+31 more'. The subject is 'ICITISEE 2016 is now published in IEEE Xplore'.

The email body contains the following text:

To help protect your privacy, some content in this message has been blocked. To re-enable the blocked features, [click here](#).

To always show content from this sender, [click here](#).

Dear ICITISEE 2016 Participants,

We are glad to inform you that "2016 1st International Conference on Information Technology, Information Systems and Electrical Engineering (ICITISEE)" is now published in IEEE Xplore, and can be accessed in <http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=7786135>

Thank you for your participation in ICITISEE 2016.

Sincerely yours,

Tri Astuti, S.Kom., M.Eng.  
General Chair

### Lampiran 26 Detail Kritik

Dear Mr. Rio Caesar:

Congratulations - your paper #1570286575 ('An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area') for ICITISEE 2016 has been accepted and will be presented in the session titled \_\_\_.

The reviews are below or can be found at <https://edas.info/showPaper.php?m=1570286575>.

===== Review 1 =====

> \*\*\* Relevance and timeliness: Rate the importance and timeliness of the topic addressed in the paper within its area of research. Average (3)

> \*\*\* Technical content and scientific rigour: Rate the technical content of the paper. (e.g. completeness of the analysis or simulation study, thoroughness of the treatise, accuracy of the models, etc), its soundness and scientific rigour. Average (3)

> \*\*\* Novelty and originality: Rate the novelty and originality of the ideas or results presented in the paper. Average (3)

> \*\*\* Quality of presentation: Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references Poor (1)

> \*\*\* Recommendation: How do you rate your recommendation? Possible Accept. (2)

> \*\*\* Detailed comments: Please justify your recommendation and suggest improvements in technical content or presentation.

The 3d face model segmentation idea of the work is good, but implementation, contribution not strong enough. Also, the writing is very poor, and at times, looks/sounds inaccurate.

===== Review 2 =====

> \*\*\* Relevance and timeliness: Rate the importance and timeliness of the topic addressed in the paper within its area of research. Excellent (5)

> \*\*\* Technical content and scientific rigour: Rate the technical content of the paper. (e.g. completeness of the analysis or simulation study, thoroughness of the treatise, accuracy of the models, etc), its soundness and scientific rigour. Average (3)

> \*\*\* Novelty and originality: Rate the novelty and originality of the ideas or results presented in the paper. Average (3)

> \*\*\* Quality of presentation: Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references Average (3)

> \*\*\* Recommendation: How do you rate your recommendation? Accept. (3)

> \*\*\* Detailed comments: Please justify your recommendation and suggest improvements in technical content or presentation.

Paper need to detail the tools or algorithm for process of clustering and segmentation

=====  
===== Review 3 =====

> \*\*\* Relevance and timeliness: Rate the importance and timeliness of the topic addressed in the paper within its area of research. Good (4)

> \*\*\* Technical content and scientific rigour: Rate the technical content of the paper. (e.g. completeness of the analysis or simulation study, thoroughness of the treatise, accuracy of the models, etc), its soundness and scientific rigour. Average (3)



> \*\*\* Novelty and originality: Rate the novelty and originality of the ideas or results presented in the paper. Average (3)

> \*\*\* Quality of presentation: Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references Below Average (2)

> \*\*\* Recommendation: How do you rate your recommendation? Possible Accept. (2)

> \*\*\* Detailed comments: Please justify your recommendation and suggest improvements in technical content or presentation.

The paper satisfactorily written with validations and results. However, the presentation is weak, in terms of language and syntax. Rewrite the abstract by clearly stating the problem addressed in the paper and the proposed solution. 1. Replace STATE OF THE ART with RELATED WORK besides remove subsections from this part. Please follow the standards. 2. Redraw all the figures 3. Language mistakes are plenty.

Regards,

The conference chairs

**Lampiran 27 Paper Publikasi**

# An Automatic 3D Face Model Segmentation for Acquiring Weight Motion Area

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**Abstract**— Inside facial animation works there is an animator that need to be skilled enough to produce detailed animation, so the facial animation can be smooth when doing facial expressions. Every animated character requires special handling based on the characteristics of the size and location of the bone. This process, where every face model need special handling were time consuming and tedious work. For that issue this research propose method for using motion capture marker data in 3D face model for automatically segment weight motion area based on the feature point. Marker data that came from motion capture of human model will be used to represent a centroid of vertex cluster that forming expressions in animated character. The data grouping process will be spherical coordinate result calculation between feature point and vertices using modified nearest neighbor algorithm. The result obtained in this research will show the weight motion area that generated automatically from the feature point based on nearest neighbor algorithm in a 3D face model.

**Keywords**—facial animation; segmentation; weight motion area; nearest neighbor; feature point

## I. INTRODUCTION

Human being can easily recognize the non-natural expressions of others human excretion especially from the animated character, changes in motion on the face for displaying an expression or movement of the chin and lips when talking is considered when creating realistic facial animation. Meanwhile, with facial expressions human can do some short of non-verbal communication with others [1]. To approach this naturalness, facial motion capture applied to the human face. The motion capture is aimed at capturing the position and orientation of an object in physical space then record that information to be used and developed in the virtual world [2]. Then 3D face models represent the human face movement.

Main issues that arise from producing detailed animation is the time that consumed in the work process and in the recent days this process is still done manually by the animator. This time consumed process implicate to the cost of the production [3]. Naturally, every movement in the human face always move as one group, one point affect other point and every region affect another region. In 3D face character, after those face model finished it need to be

processed again, before delivered to animator for animation to determine the joint and movement controller of the 3D face model. This process is called facial rigging [3], and this process implicate from pre-determining cluster point of the 3D face model.

This research proposes an automatic method on the process of facial animation especially when determining regions that affected from the movement of facial rigging on the 3D face character. This phase proposes approach of feature point with nearest neighbor method as solution when segment the face based on feature point marker, and in this case is marker position on face.

This feature point with nearest neighbor method on 3D face character case using geodesic distance instead Euclidian distance for calculate the distance of every vertex on 3D face model to the feature point because the nearest distance in 3D face model is not straight line but curve that come along with the surface [3], as we assume that 3D face model just like sphere. So, every coordinate of the 3D face model that stored as Cartesian coordinate need to be converted first to the spherical coordinate.

## II. RELATED WORK

Segmentation in image processing is a process that aimed to retrieve the object from the image or to divide the image to regions with every object or regions that have attribute similarity. Segmentation itself is can be used for divide shape or color. As for this research the segmentation is used for clustering the vertices of the 3D face model with nearest neighbor algorithm with feature point approach to automatically grouped the member from every vertex.

The main rule from clustering process of nearest neighbor is to identify category of unknown data using already established nearest neighbor data group. This principle already used in many cases, such as pattern recognition [4,5], text categorization [6], and object recognition [7]. This method already gone through many developments to simplified the computation and adaptation to the problem.

Generally, nearest neighbor technique is come to two categories: 1) structure less and 2) based on structure [7]. On

the first category, data is grouped into training data and sample data. Distance calculation is performed on the entire training data to the sample data, and if the distance between those point is minimum those point is expressed as the nearest neighbor. As for the second category, based on the name, a data structure is used as reference for computing the nearest neighbor. Both algorithm is still focuses on the data domain of face recognition, meanwhile in this research, structure less technique will be used for determining movement area on 3D face model that have association with the location of the marker.

Data in motion capture consist of movement for the sparse feature points. Aim from using feature point is to simplified the process of facial animation and the challenge in feature point is to produce facial animation as natural as possible with the number point that used is less than the number of point that make up surface of 3D face model [8]. On the other side, using feature point can help to lighten the calculation done by computer than using an algorithm that calculate all the surface point of the 3D face model.

Facial animation is concentrated in creating realistic expression in 3D face model [9]. There are two techniques that used in the making of facial animation 1) based on marker and 2) marker less. By using marker that mean facial animation can be done automatically by calculate the feature point on the 3D face model. While in the marker less, facial animation automation is done by animator that using the surface as comparison.

3D face model can be sees as sphere which is have lots of hills and valley. Because of that, different approach is need to be done to calculate the distance of every vertex back to the feature points. Unlike in the flat surface where shortest distance between two points is straight line and calculated using Euclidean distance, in the round surface the shortest distance between two point is a curve and is calculated using Geodesic distance. By using geodesic distance before the distance can be calculated, the coordinates need to be convert first. As for Euclidean use Cartesian coordinate and Geodesic use spherical coordinate.

### III. EXPERIMENTAL DESIGN

Our research conducted on low polygonal 3D human face model data (fig.1) and processed with reference from 33 feature points (fig. 2) acquired from human face motion capture marker data.

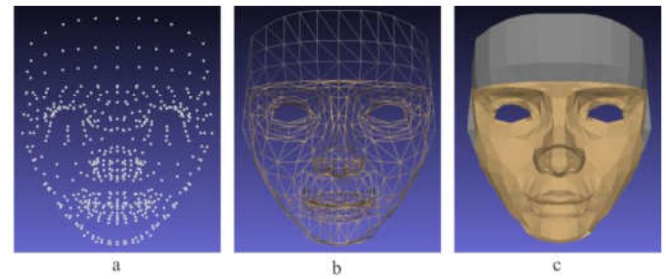


Fig 1. a) 3D face vertices; b) 3D polygonal line; c) low-poly 3D face model



Fig 2. Feature Point

The observation is done by synthesis approach of clustering directly across the surface vertices on 3D models of human face with centroid at the point of the motion features. The aim of this research is for divide member of the vertices of 3D face model into feature point cluster to conclude local deformation in the region that influenced by movement of the feature point.

The early phase of the research is to synthesis the vertices data extracted from 3D human face model and the feature point that mapped based on human face. After that, clustering process is conducted to form a grouping vertex area on the face that will able to become a cluster area of the weight for each feature point on the face motion feature. Grouping method with clustering techniques based on the location of the feature-points on the face is a novelty that we propose in this experiment to lead to the automation of adaptive grouping to any form of 3D face models. As we can see in fig 3, two data input is processed to get synthesis result from the 3D face model vertices and 33 feature points and then next phase is conducted until the segmentation based nearest neighbor of vertices to feature point so can be assigned weight paint for the 3D face model.

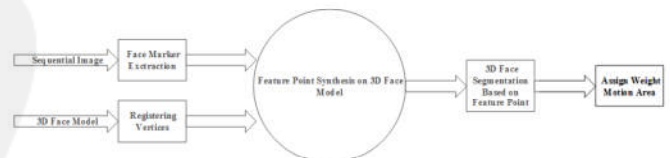


Fig 3. Research Flow

Approach that used in this research when grouping vertex that assemble 3D face model based on feature point is nearest neighbor method where the distance is calculated

using spherical coordinates with great circle distance haversine formula.

Base conversion from Cartesian into spherical coordinates that is used for the distance calculation is start by calculated the distance (1), then continue to calculate the latitude (2) and the longitude (3) for each vertex.

$$\rho = \sqrt{x^2 + y^2 + z^2} \quad (1)$$

$$\phi = \arccos\left(\frac{z}{\rho}\right) \quad (2)$$

$$\theta = \arccos\left(\frac{x}{\rho \sin \phi}\right) \quad (3)$$

After we get the right coordinate for calculation, the distance of each vertex to the feature point is calculated using great circle distance haversine formula (9). "a" (7) is the result of calculation using latitude and longitude parameter and is the square of half the cord length between points. While "c" (8) is the angular distance.

$$a = \sin^2\left(\frac{\Delta\phi}{2}\right) + \cos\phi_1 \times \cos\phi_2 \times \sin^2\left(\frac{\Delta\theta}{2}\right) \quad (7)$$

$$c = 2 \operatorname{atan2}\left(\sqrt{a}, \sqrt{1-a}\right) \quad (8)$$

$$d = \rho \cdot c \quad (9)$$

TABLE I. CONVERSION AND DISTANCE CALCULATION EXAMPLE

	Cartesian			Geodesic			distance
	X	Y	Z	$\rho$	$\theta$	$\phi$	
A	4	5	6	8.774964	0.896055	0.817889	9.127189
B	1	2	3	3.741657	1.107149	0.640522	

As we can see in table 1 as calculation example, coordinate cartesian is converted into spherical coordinate and then the distance is calculated. From the distance of each vertex that we get and compare it with the feature point location, if a point has the closest or minimum distance, those points are expressed as nearest neighbor and will be grouped as member for feature point accordingly.

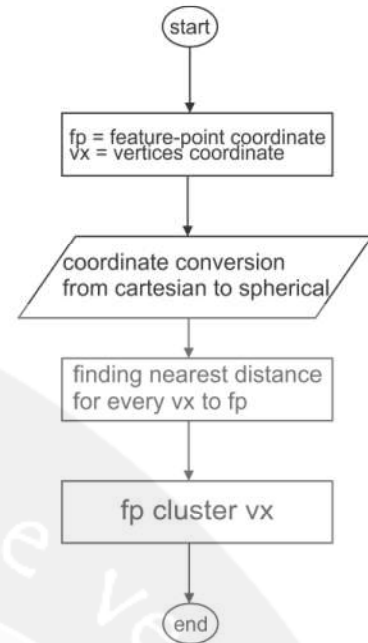


Fig 4. Flowchart fp-NN Clustering (proposed method)

Clustering process used in this research is refer to clustering algorithm  $k$ -Nearest Neighbor with some modification in the process of Definition value of  $k$  [3]. Algorithm  $k$ -Nearest Neighbor ( $k$ -NN) is a method to perform the clustering of objects based on the learning process from data that were located closest to the object. In this case, learning data is the data of vertices which are located close to the point features. The process of modified clustering using  $k$ -NN to find a feature point cluster can be seen in the following flowchart (Fig 4), namely feature point Nearest Neighbor(fp-NN) Clustering.

#### IV. RESULT AND DISSCUSION

Segmentation process in this research is using manual process because this research is focused on the segmentation itself. In the Fig 5, the two data input is processed before to get the 33 feature point data and 3324 vertices that form 3D face model. Those two major data synthesized and calculated to get the distance between 3324 vertices to 33 feature points. This distance then will be observed with nearest neighbor algorithm to group the corresponding vertex from the feature point and form weigh point of the 3D face model.

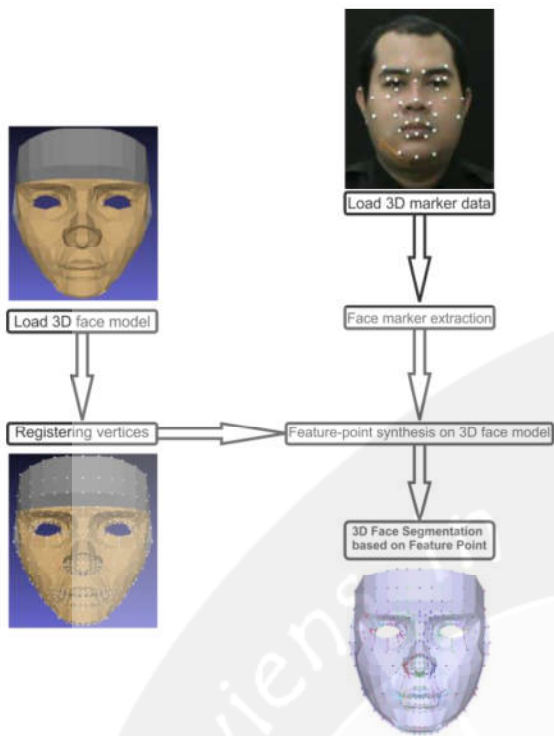


Fig 5. Schematic overview

At first, vertices data from the 3D face model (table 2) and feature point (table 3) need to be extracted and converted into spherical coordinate from originally Cartesian coordinate before calculation of the distance and grouping the vertices.

TABLE II. FACE MODEL COORDINATE

	X	Y	Z
1	-0.0748519	0.173604	0.0779839
2	-0.0841419	0.17433	0.05629
3	-0.0847029	0.161148	0.0449887
4	-0.0748519	0.173604	0.0779839
5	-0.0847029	0.161148	0.0449887
6	-0.0818852	0.15655	0.0647916
7	-0.0127411	0.167827	0.100667
8	-0.0226703	0.167376	0.0964337
9	-0.0207969	0.156281	0.101071
10	-0.0127411	0.167827	0.100667
⋮	⋮	⋮	⋮
3314	-0.0842711	0.213026	0.0673735
3315	-0.0728902	0.220582	0.0957139
3316	-0.0842711	0.233026	0.0653735
3317	-0.0728902	0.220582	0.0957139
3318	-0.0728902	0.235582	0.0947139
3319	-0.0572479	0.187655	0.0858353
3320	-0.0582105	0.179475	0.088362
3321	-0.0576436	0.182243	0.088103
3322	-0.0572479	0.187655	0.0858353
3323	-0.0576436	0.182243	0.088103
3324	-0.0562258	0.189032	0.0817365

TABLE III. FEATURE POINT COORDINATE

	X	Y	Z
1	-0.08414	0.1743	0.05629
2	-0.06985	0.2034	0.08725
3	-0.06173	0.1663	0.08874
4	-0.04735	0.1149	0.07787
5	-0.04721	0.1995	0.09649
6	-0.04205	0.1752	0.09462
7	-0.0391	0.1961	0.09997
8	-0.03842	0.08712	0.06429
9	-0.03477	0.1469	0.09699
10	-0.02803	0.1116	0.08813
⋮	⋮	⋮	⋮
23	0.01811	0.1144	0.102
24	0.02673	0.1113	0.0883
25	0.03477	0.1469	0.09699
26	0.03842	0.08712	0.06429
27	0.0391	0.1961	0.09997
28	0.04205	0.1752	0.09462
29	0.04721	0.1995	0.09649
30	0.04735	0.1149	0.07787
31	0.06173	0.1663	0.08874
32	0.06985	0.2034	0.08726
33	0.08414	0.1743	0.05629

From this point, the vertices data need to be convert from Cartesian to spherical using basic spherical Cartesian conversion method and then continued by calculate the distance using great circle distance haversine formula between two point of each vertex to the feature point (table 4).

TABLE IV. CONVERSION AND DISTANCE CALCULATION

	VERTEX			CENTROID			D
	$\rho$	$\theta$	$\phi$	$\rho$	$\theta$	$\phi$	
1	0.20450	1.9778	1.1795	0.2015	2.0205	1.2877	0.01286
2	0.20159	2.0204	1.2878	0.2320	1.901	1.1853	0.00001
3	0.18752	2.0547	1.3285	0.1983	1.9262	1.1069	0.01623
4	0.20450	1.9778	1.1795	0.1466	1.9616	1.0110	0.01286
5	0.18752	2.0547	1.3285	0.2265	1.8031	1.1308	0.01623
6	0.18817	2.0527	1.2192	0.2035	1.8063	1.0872	0.02691
7	0.19611	1.6465	1.0317	0.2235	1.7676	1.1071	0.00842
8	0.19449	1.7054	1.0520	0.1148	1.9861	0.9769	0.01508
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
3314	0.2387	1.947	1.284	0.154	1.413	0.848	0.0129
3315	0.2512	1.889	1.179	0.144	1.335	0.913	0.0141
3316	0.2562	1.917	1.312	0.179	1.338	0.999	0.0135
3317	0.2512	1.889	1.179	0.114	1.155	0.976	0.0141
3318	0.2641	1.870	1.204	0.223	1.373	1.107	0.0078
3319	0.2141	1.866	1.158	0.203	1.335	1.087	0.0162
3320	0.2083	1.884	1.132	0.226	1.338	1.130	0.0140
3321	0.2104	1.877	1.138	0.146	1.179	1.011	0.0170
3322	0.2141	1.866	1.158	0.198	1.215	1.106	0.0091
3323	0.2104	1.877	1.138	0.232	1.240	1.185	0.0091
3324	0.2134	1.859	1.177	0.201	1.121	1.287	0.0170

Observation in this research is conducted in the process of determining minimum distance for each vertex to

the feature point, so it can be assumed as a center for the vertex and become one segment on the location of those cluster centroid. It assumed that after all 33 cluster is done processed, there will be 33 point of segmentations on the face that will be similar with the weight point or region affected motion. This weigh paint result as propose by researcher in this paper is can be visually shown as in figure 6 where each vertex that correspondent to nearest feature point is specifically colored to some membership.

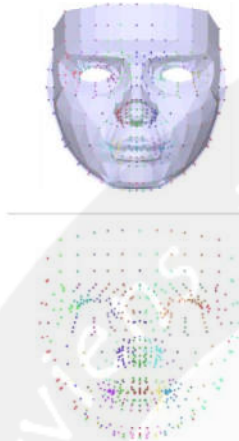


Fig 6. Clustering result for 3D human-face model with 3324 vertices (low polygonal models)

Table 5 show us sum of member for each feature point correspondently and percentage of each feature point cluster region on surface of the 3D face model.

TABLE V. MEMBERSHIP OF EACH VERTEX TO THE FEATURE POINT

FP	n	%
1	100	3.008424
2	122	3.670277
3	55	1.654633
4	44	1.323706
5	98	2.948255
6	68	2.045728
7	127	3.820698
8	17	0.511432
9	55	1.654633
10	206	6.197353
11	133	4.001203
12	175	5.264741
13	55	1.654633
14	135	4.061372
15	25	0.752106
16	40	1.203369
17	159	4.783394
18	250	7.521059
19	55	1.654633
20	162	4.873646
21	55	1.654633
22	169	5.084236
23	133	4.001203
24	200	6.016847
25	55	1.654633
26	22	0.661853

27	127	3.820698
28	68	2.045728
29	98	2.948255
30	45	1.353791
31	55	1.654633
32	116	3.489771
33	100	3.008424

The result of this research that for acquiring motion influenced region using minimum distance in 3D face model great circle distance haversine formula, if compared with previous research that using Euclidean distance formula [3] for determining distance between vertex and the centroid is have approximate data trend (fig 7 and fig 8) which is going up.

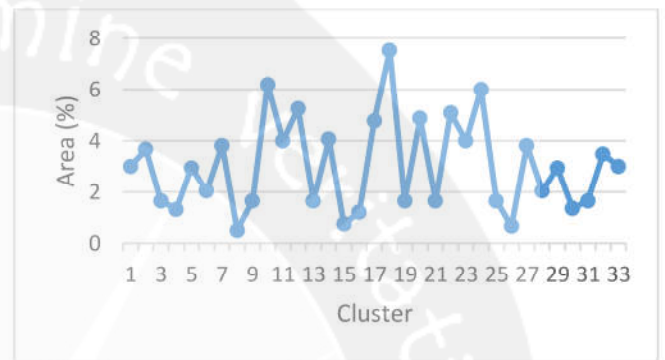


Fig 7. Geodesic data trend

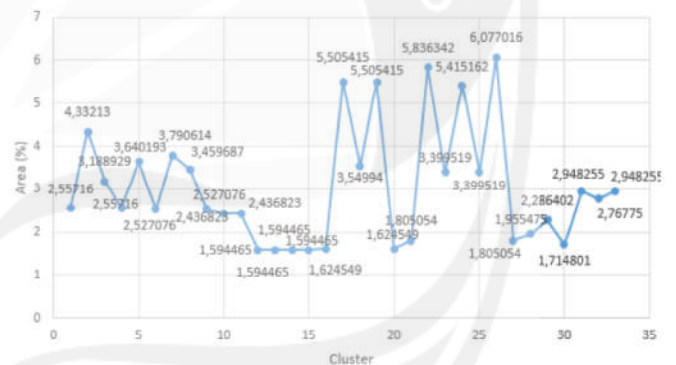


Fig 8. Euclidean data trend

## V. CONCLUSION

The experiments were conducted to search for automation process using different distance calculation approach in generating weighted area which affected by the movement of the feature-points on the 3D face model. By compare this research and previous research although different distance calculation method is used, this research also still proves that feature point approach with nearest neighbor algorithm is still able to simplified the process to acquiring motion affected region from centroid deformation.

Even though the clustering process using geodesic distance is work well in low-poly 3D face model as from previous research that using Euclidean distance, performance in this research can be improved and tested with other 3D face

model like cartoon character face for acquiring more detailed result from automatic segmentation using feature point or marker.

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