# **Author's Kit**

Thank you for participating in the 2020 ASEE PNW Section Conference at Gonzaga University in Spokane, WA.

This kit is a guide to help you submit and manage all abstracts and papers. Authors are responsible for following the procedures and meeting all deadlines and requirements in the paper submission process. ASEE is not responsible for papers that are withdrawn because they were incomplete or deadlines were missed.

These guidelines apply to all submissions for inclusion in the 2020 section conference program including **full paper**, **presentation only**, **poster**, **and workshop**. Presentation categories are summarized as follows (from the call for papers):

There are four possible presentation formats for this conference. Please choose the option or options that are right for you. Works-in-progress (WIPs) are welcome in any of the presentation formats.

## **Papers for Publication in Conference Proceedings**

Please indicate in the first sentence of your abstract that you intend to follow up with a full paper. Submit an abstract of maximum 500 words and include, as appropriate, a clear description of the objectives and motivation, relevant background, and results. Authors of accepted abstracts will present their work in a conference session and will be required to prepare a full manuscript for review prior to publication in the conference proceedings. Full papers are also eligible for the section best paper competition; the winner advances to the zone level and, if successful, to the national level. It is expected that the author(s) of a full paper submission will support the conference by also serving as a reviewer for one or more abstracts and manuscripts.

#### **Abstract-Reviewed Presentation**

Please indicate in the first sentence of your abstract that you intend to prepare a presentation only (no full paper). Submit an abstract of 250-500 words and include, as appropriate, a clear description of the objectives and motivation, relevant background, and results. It is not required to follow up with a full paper in order to present in a conference session.

#### **Abstract-Reviewed Poster**

Please indicate in the first sentence of your abstract that you intend to prepare a poster only (no full paper or presentation). Submit an abstract of up to 250 words and include, as appropriate, a clear description of the objectives and motivation, relevant background, and results. It is not required to follow up with a full paper in order to participate in the conference poster session.

## Workshops

Please indicate in the first sentence of your abstract that this is a workshop proposal. Limit your workshop description to one page that clearly states the objectives, targeted audience, and learning outcomes, as well as activities planned and approximate length. Please indicates if participants will need to bring supplies such as a laptop.

Questions regarding the abstract and paper submission can be directed to the 2020 Program Chair, Krishna Pakala (krishnapakala@boisestate.edu).

For more details about the conference, please check the conference website: <a href="https://pnw.asee.org/conference-info/">https://pnw.asee.org/conference-info/</a>

## 2020 ASEE PNW Section Conference Timeline

All deadlines occur at Midnight, Eastern Standard Time on the days listed

Apr. 10, 2020	<u>All Authors</u> : Website opens for abstract submission - <b>See Appendix B for formatting guidelines.</b>
Aug. 07, 2020	Author Deadline: All abstracts must be submitted by this date.
Aug. 21, 2020	Abstract Decision Deadline: Author notified whether abstract is accepted.
Sep. 18, 2020	<u>Author Deadline:</u> All blind draft papers must be submitted by this date - <b>See Appendix C for formatting guidelines.</b>
Oct. 02, 2020	<u>Draft Decision Deadline</u> : (Program Chair Deadline) Author notified of any requested revisions.
Oct. 09, 2020	Deadline to remove all blind indicators and upload Final Paper including cover page - See Appendix D for formatting guidelines.  Add all authors.  Update all author bios.  Accept copyright for paper.
	No changes to papers will be accepted after this date.

All deadlines occur at 23:59 EST on the days listed.

# **Author Responsibilities**

Each Author who submits an abstract and paper should:

- · Read this kit and follow all of the instructions (this is extremely important)
- Submit their abstract as a TEXT ONLY and their draft as a PDF ONLY
- Check that all information; from the paper title to the spelling of co-authors' name/s, is correct
- Indicate who is presenting the paper
- · Pay the registration fee
- · Assign someone else to manage your paper or pay your fees, if you are unavailable to do so yourself
- Contact ASEE Conferences Staff at conferences@asee.org or 202.350.5720 with any questions or problems

## **Potential problems**

**Be advised**, your paper will not be published if you:

- Fail to submit a final copy of the paper before the deadline
- · Fail to register for the conference by the deadline
- Fail to assign the paper's copyright to ASEE so it can be published

Other authors have had papers published with unfortunate mistakes. Please don't let these happen to you:

- Failure to add co-authors and check the spelling of their names before marking your paper as finalized
- Failure to proofread your biography before submitting the final paper
- Failure to check the uploaded version of the final paper for formatting and other errors

#### **NOTICE!**

It is only necessary to submit a paper draft if you intend for your paper to be published in the conference proceedings. No additional submission steps beyond the abstract phase are required for abstract-reviewed presentations, abstract-reviewed posters, or workshops.

#### **Conditions:**

- Peer review occurs for both abstracts and papers. Abstract acceptance does not guarantee acceptance of the paper.
- Submission of abstracts and final papers will be via the Monolith system and in accordance with ASEE published deadlines.

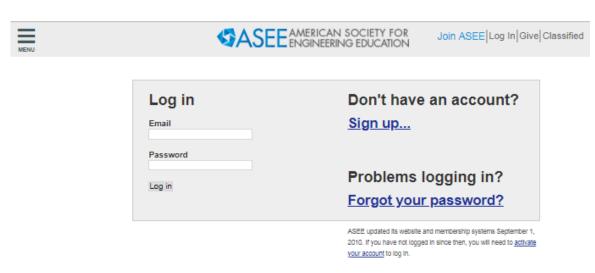
## Plagiarism Policy:

 Please be sure to familiarize yourself with ASEE Plagiarism Policy. All authors are expected to comply with this policy. The policy can be found <a href="here">here</a>.

## Logging into the System



From the home page (<u>http://www.asee.org</u>), click on "log in" in the upper right hand corner



#### **MEMBERS**

- If you are an ASEE member, do not try to register for a new account, please contact us at conferences@asee.org for assistance if you are unable to activate your account.
- When you return on subsequent visits, log in with your email address and the password you chose when activating or registering.

#### **NON-MEMBERS**

• If you are a non-ASEE member, you must create an free account with us.

#### **WELCOME PAGE**

- You will be taken to your Welcome Page where you will find "Upcoming Conferences" click on that and then click on the "Manage Papers" link under the **2020 ASEE PNW Section Conference**.
- If the following page does not load navigate to it: <a href="https://www.asee.org/public">https://www.asee.org/public</a>

#### - Upcoming Conferences

#### 2020 ASEE Annual Conference and Exposition

Montreal, Quebec, Canada - June 21 - 24, 2020

Registration · Manage papers · Contact program chairs · Conference homepage

2020 Engineering Deans Institute (EDI) - This event has been CANCELLED - contact conferences@asee.org for further details if necessary

Las Vegas - April 14 - 16, 2020

Housing · Conference homepage

#### 2020 Pacific Southwest Section Annual Conference

Davis - Apr 30 - May 2, 2020

Manage papers - Contact program chairs

# 2020 NETI 2 HAS BEEN CANCELLED. NEXT NETI 2 SCHEDULED FOR JUNE 2021

Montreal, Canada - June 19 - 20, 2020

Housing · Conference homepage

#### **Engineering Communicators Conference**

Washington - July 13 - 14, 2020

Registration - Conference homepage

#### 2020 First-Year Engineering Experience

East Lansing - July 26 - 28, 2020

Manage papers - Contact program chairs

## 2020 Engineering Professionals for Industry 4.0 National Workforce Summit 2020

Washington · October 8 - 9, 2020

Registration

#### 2020 ASEE PNW Section Conference

2020 ASEE PNW Section Conference · November 4 - 6, 2020

# Paper procedures

If you have any questions regarding your paper reviews, revisions, accept/reject decision or paper assignments to timeslots; you must contact the Program Chair directly.

Program chairs contact information is located on your Manage Papers page.

#### **Abstract** Author submits abstract

- Program Chair assigns reviewers
- There is a minimum of one (1) review required for an abstract
- Reviewers read, rank, and comment on abstract
- Program Chair accepts or rejects abstract

## **Draft** Author submits draft

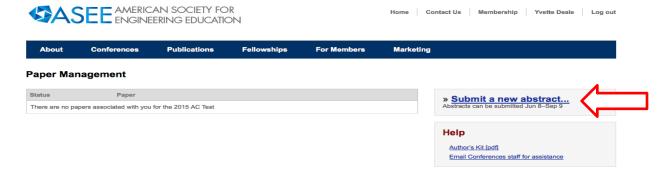
- · Program Chair assigns reviewers
- Three (3) reviews are required for a draft paper
- Reviewers read, rank, and comment on paper
- Program Chair receives reviewers requested revisions, consolidates revisions and sends them to Author if applicable
- Program Chair accepts/rejects papers and revised papers

**Register** Author pays registration fee

Finalized Author submits final paper

## Submit abstract (April 10, 2020 - August 07, 2020)

To submit an abstract, enter the <u>text in the box</u> indicated and enter the required information about yourself and the abstract. You can select exactly how your name and institutional affiliation will be printed in the conference proceedings.



ASEE Plagarism Policy

Preamble

Policy on Plagiarism and Duplicate Publication

American Society for Engineering Education May 31, 2013; Revised October 2, 2014

The American Society for Engineering Education serves the engineering and technology communities by offering professional conferences, networking opportunities, and support of research in the various fields of

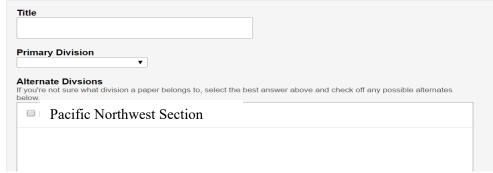
NOTE You must read to the bottom of the plagarism policy in order to accept

I have read and accept the above terms and notices

2. Provide your abstract

Please paste the text of your abstract below.

3. Tell us about this paper



Please be sure that an Author bio is included for each submission.

### **BE ADVISED!**

 You will be prompted to acknowledge the ASEE Plagiarism Policy before you can submit your abstract.

#### Paper Management



From the paper management screen, you can see all of the papers you have submitted or have been assigned to review.

After you submit the abstract, it appears on your paper management screen with the status message Can edit abstract.

#### **BE ADVISED!**

- You can continue to make changes to the abstract until the program chair assigns reviewers.
   HOWEVER.
- Once reviews are in progress, the abstract's status changes to "Waiting"
  - Therefore, please only submit the abstract text when it is ready to be reviewed.
- If you need to revise your abstract after it's assigned to a reviewer, you must contact your program chair for assistance. It is at your chairs' discretion whether they will update the abstract for you or not.

### Paper Management





After the reviews are finished, the program chair decides to accept or reject your abstract.

If your abstract is accepted, the status changes to *Upload draft*. Note that you do not need to follow up with a draft if your preferred format is abstract-reviewed presentation or poster.

## Draft Paper Submission Process (Draft upload deadline, September 18, 2020)

#### Paper Management





If your abstract is accepted, the status changes to "upload draft."

- The paper's details page provides a link to read comments from reviews as forwarded by the program chair.
- When the draft version is completed, Choose file (as a PDF only) and Upload draft to submit it.
   Make sure that the PDF file you upload doesn't include your name or initials.
- You can upload your draft paper as often as needed until the program chair assigns the draft paper to be reviewed.
- Again, the paper's status changes to Waiting until the reviews are complete and the program chair has made his or her decision.

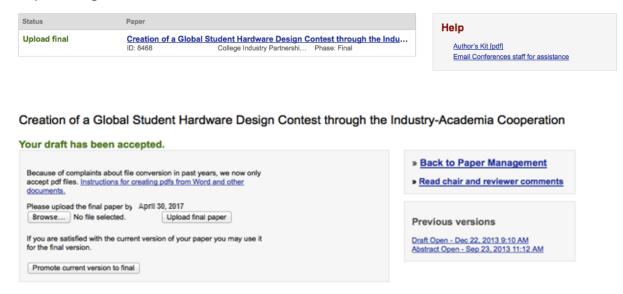
#### BE ADVISED!

- You can continue to make changes to the draft until the program chair assigns reviewers.
- Once reviews are in progress, the paper's status changes to Waiting"
  - Therefore, we strongly advise that you only upload a draft when it's ready to be reviewed.

If you need to revise your draft after it's assigned to a reviewer, you must contact your program
chair for assistance. It is at your chairs' discretion whether they agree to upload a new version
of the draft for you or not.

If the paper is accepted as is, its status changes to *upload final*.

#### Paper Management



## If Revisions have been requested, they need to be submitted (by October 09, 2020).

- As with abstracts, you can view comments from the reviewers on the paper's details page.
- If the paper is accepted with revisions, its status changes to Revise.
- When the requested revisions are ready, select the PDF file and Upload.
- When requested revisions for the paper are uploaded, its status changes to Waiting until it is accepted or rejected by the program chair.

#### BE ADVISED!

- If you have been requested to make revisions, the system automatically assigns the revision to a reviewer as soon as it is uploaded. <u>Therefore, you will only be able to upload ONE VERSION of</u> a revision, so please be sure it is the correct one.
- If you need to upload a different version of the revision, you must contact your program chair for assistance. It is at your chairs' discretion whether they agree to upload a new version for you or not.
- ASEE HQ Staff cannot upload any attachments for you. That is done only by the Chair.

#### Paper Management



Edits cannot be made during the "waiting" stage.

## **Paper Acceptance:**

Once the final paper is accepted by the chair, you will need to complete the following by October 09, 2020.

- 1. Select one author as Presenter.
  - a. Please note only one (1) author can be listed in the system as a "Presenter" but any and all authors can attend and/or present.
  - b. If a specific author is not selected, the corresponding author will be selected as the presenting author by default.
- 2. One author must register and pay for the conference.

### **BE ADVISED!**

- Your paper will be withdrawn if at least one author is not registered by the October 9th deadline. Register at the Conference website: Will be provided at a later date
- The presenting author must be a registered participant in order to present their paper at the conference.

## Finalize Paper:

By October 09, 2020 you will need to finalize your paper by completing the following requirements:

- 1. Start with the blind components reinstated, such as name, institution, etc.
- 2. Accept the Copyright.
- **3.** Make sure all co-authors have been invited to a paper, accepted the invitation, and have completed their information.
  - **a.** See instructions for adding co-authors.
  - **b.** Check for correct spelling of co-authors names.
- 4. Submit final version of all author bio/s.
- **5.** Review paper prior to final submission for formatting errors or concerns.

#### BE ADVISED!

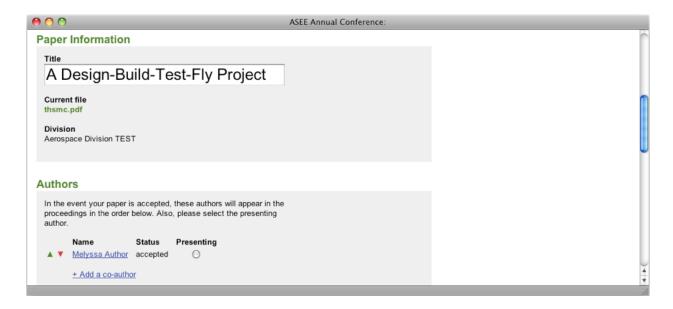
Papers cannot be assigned to a session until the paper is finalized

#### **Session Assignments:**

- 1. Program chairs are scheduled to have all papers assigned to sessions by October 09, 2020.
- 2. Papers are assigned by preferred order by the Program Chair.
- 3. If you have any issues with any session assignments, you must contact the program chair directly.
  - a. ASEE HQ staff cannot re-assign papers. That is only done by the Program Chair.

#### **APPENDIX A**

## Adding co-authors



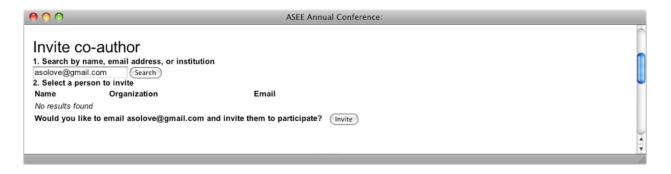
- Every paper has one main or corresponding author, who conducts all of the main business previously discussed.
- If your paper has co-authors, you should invite them so that they can log in, accept the
  invitation and confirm how their names, institutions, and biographies will be printed in the
  paper, in the program and on the conference proceedings.
- Co-authors can also view the paper's status.

#### **BE ADVISED!**

• Only corresponding authors can upload attachments and only corresponding authors can assign that designation to a different co-author.

In the *Authors* section, *add a co-author* by searching for a name or institution.

• If the co-author is an ASEE member or has previously participated in the conference, he or she will appear in the search results.



- If you can't find a co-author by name, try their email address. If we don't have an account for that address, you can *invite* them by email.
- The co-author can then create an account and decide how their name, institution, and biography will appear.
- Once you have added co-authors, you can place them in order. The ordering you set will be the order they appear in the program guide and on the paper's cover page.
- Also the default is for the corresponding author to be the one presenting the paper. If that is not correct, please select the presenting author from the list of co-authors. This can be done using the radio button next to the co-author.

#### **APPENDIX B**

## **ABSTRACT FORMAT GUIDELINES**

# BE ADVISED: ABSTRACTS ARE SUBMITTED VIA TEXT BOX ONLY . PLEASE NOTE THE FOLLOWING:

#### Title:

- 1. Title: The title must be included
- 2. Author and Affiliation: Submissions are done in a double blind. No author or affiliation information is to be included on any abstracts.
- 3. Footers: Do not include any in your abstract.

## Body of the Abstract (beginning under title information)

1. Length: Abstracts should generally be between 250 - 500 words.

#### Biographical Information

Biographical information is to be saved in Monolith on the Author/Co-Author page. It will be automatically added to your paper at the end of the process.

#### Other

Do not include session numbers in any part of the document, unless specifically requested to do so by a Call for Papers.

#### **Additional Guidelines and Suggestions:**

- As appropriate, include the pedagogical theory or approach being used;
- Indicate the form that your outcome(s) will take as appropriate;
- As applicable, methods of assessment should be made clear.

#### **APPENDIX C**

## DRAFT PAPER FORMAT GUIDELINES

Title Page (top part of first page only)

- 1. *Title of Paper*: The title must be centered with at least a one and one-half inch margin on the left and right.
- 2. Font: Times New Roman typeface is required, bold faced, 14 point.
- 3. *Author and Affiliation*: Submissions are done in a double blind. No author or affiliation information is to be included on any abstracts or draft papers.
- 4. Footers: These will be automatically added to your papers. Please leave them blank.

Body of the Paper (beginning under the title information on the first page and continuing with all subsequent pages)

- 1. First Page: The paper will be in a one-column format with left justification.
  - There must be a one inch margin on the left, right, and bottom.
  - Font: Times New Roman typeface is required, 12 point, skipping one line between paragraphs.
- 2. Second and All Subsequent Pages: There must be a 1 inch margin all around (top, bottom, right, left) in one column format, left justification, skipping one line between paragraphs.
  - *Font*: Times New Roman typeface is required, 12 point, using only standard symbols and abbreviations in text and illustrations.
- 3. *Abstracts*: Abstracts are not required, but can be included between the title and the body of the paper, but not on a separate page.
- 4. *Headings*: Headings are not required but can be included. If used, headings must be left justified, lowercase, with the same font and size as the body of the paper. There must be only one blank line between the heading and the paragraph.
- 5. Page Numbering: Do not number the pages.
- 6. *Length*: There is no set limit for the number of pages a paper can or must be. (Please note, even though there is no current limit for the number of pages, reviewers as well as readers of your work appreciate conciseness.)
- 7. Pages can be landscape to accommodate graphics if necessary, all other requirements above still apply.
- 8. *Graphs, Tables, Figures, Appendices*: Graphs, tables, figures and appendices must fit within the margins (one inch all around) and match the font format (when possible). Tables and figures should be included in the main text, as close to the point of their introduction as possible. Figure and table numbering should be independent.
- 9. *References*: The preferred citation style is IEEE see Appendix E.

## 10. Bibliography:

- The bibliography must begin four spaces below the body of the paper.
- The margins of the bibliography must be the same as the rest of the paper.
- The bibliography must be in Time New Roman, 10 point.
- Every reference must be listed and numbered.

#### Biographical Information

Biographical information is to be saved in Monolith on the Author/Co-Author page. It will be automatically added to your paper.

#### Other

Do not include session numbers in any part of the document.

#### **APPENDIX D**

## FINAL PAPER FORMAT GUIDELINES

Title Page (top part of first page only)

- 1. *Title of Paper*: The title must be centered with at least a one and one-half inch margin on the left and right.
- 2. Font: Times New Roman typeface is required, bold faced, 14 point.
- 3. *Author and Affiliation*: Submissions are done in a double blind. No author or affiliation information is to be included on any abstracts or draft papers.
- 4. Footers: These will be automatically added to your papers. Please leave them blank.

Body of the Paper (beginning under the title information on the first page and continuing with all subsequent pages)

- 1. First Page: The paper will be in a one-column format with left justification.
  - There must be a one inch margin on the left, right, and bottom.
  - Font: Times New Roman typeface is required, 12 point, skipping one line between paragraphs.
- 2. Second and All Subsequent Pages: There must be a 1 inch margin all around (top, bottom, right, left) in one column format, left justification, skipping one line between paragraphs.
  - *Font*: Times New Roman typeface is required, 12 point, using only standard symbols and abbreviations in text and illustrations.
- 3. *Abstracts*: Abstracts are not required, but can be included between the title and the body of the paper, but not on a separate page.
- 4. *Headings*: Headings are not required but can be included. If used, headings must be left justified, lowercase, with the same font and size as the body of the paper. There must be only one blank line between the heading and the paragraph.
- 5. Page Numbering: Do not number the pages.
- 6. Length: There is no set limit for the number of pages a paper can or must be. (Please note, even though there is no current limit for the number of pages, reviewers as well as readers of your work appreciate conciseness.)
- 7. Pages can be landscape to accommodate graphics if necessary, all other requirements above still apply.
- 8. *Graphs, Tables, Figures, Appendices*: Graphs, tables, figures and appendices must fit within the margins (one inch all around) and match the font format (when possible). Tables and figures should be included in the main text, as close to the point of their introduction as possible. Figure and table numbering should be independent.
- 9. References: The preferred citation style is IEEE see Appendix E.

#### 10. Bibliography:

- The bibliography must begin four spaces below the body of the paper.
- The margins of the bibliography must be the same as the rest of the paper.
- The bibliography must be in Time New Roman, 10 point.
- Every reference must be listed and numbered.

#### Biographical Information

Biographical information is to be saved in Monolith on the Author/Co-Author page. It will be automatically added to your paper.

#### Other

Do not include session numbers in any part of the document.

## Appendix E

## What is IEEE Style?

The <u>Institute for Electrical and Electronics Engineers (IEEE)</u> is a professional organization supporting many branches of engineering, computer science, and information technology. In addition to publishing journals, magazines, and conference proceedings, IEEE also makes many standards for a wide variety of industries.

IEEE citation style includes in-text citations, numbered in square brackets, which refer to the full citation listed in the reference list at the end of the paper. The reference list is organized numerically, not alphabetically. For examples, see the <a href="IEEE Editorial Style Manual">IEEE Editorial Style Manual</a>.

#### The Basics:

**In-text Citing** It is not necessary to mention an author's name, pages used, or date of publication in the in-text citation. Instead, refer to the source with a number in a square bracket, e.g. [1], that will then correspond to the full citation in your reference list.

- Place bracketed citations within the line of text, before any punctuation, with a space before the first bracket.
- Number your sources as you cite them in the paper. Once you have referred to a source and given it a number, continue to
  use that number as you cite that source throughout the paper.
- When citing multiple sources at once, the preferred method is to list each number separately, in its own brackets, using a comma or dash between numbers, as such: [1], [3], [5] or [1] [5].

The below examples are from Murdoch University's IEEE Style LibGuide.

Examples of in-text citations:

"...end of the line for my research [13]."

"This theory was first put forward in 1987 [1]."

"Scholtz [2] has argued that..."

"Several recent studies [3], [4], [15], [16] have suggested that...."

"For example, see [7]."

**Creating a Reference List** The Reference List appears at the end of your paper and provides the full citations for all the references you have used. List all references numerically in the order they've been cited within the paper, and include the bracketed number at the beginning of each reference.

- Title your list as References either centered or aligned left at the top of the page.
- Create a hanging indent for each reference with the bracketed numbers flush with the left side of the page. The hanging indent
  highlights the numerical sequence of your references.
- The author's name is listed as first initial, last name. Example: Adel Al Muhairy would be cited as A. Al Muhairy (NOT Al Muhairy, Adel).
- The title of an article is listed in quotation marks.
- The title of a journal or book is listed in italics.

The below examples are from the <u>IEEE Citation Reference Guide</u> and <u>Murdoch University's IEEE Style LibGuide</u>.

Examples of citations for different materials:

Material Type	Works Cited
_	[1] B. Klaus and P. Horn, <i>Robot Vision</i> . Cambridge, MA: MIT Press, 1986.

2020 ASEE PNW Confere	TICE AUTHOR'S KIL
Chapter in book	[2] L. Stein, "Random patterns," in <i>Computers and You</i> , J. S. Brake, Ed. New York: Wiley, 1994, pp. 55-70.
eBook	[3] L. Bass, P. Clements, and R. Kazman, <i>Software Architecture in Practice</i> , 2nd ed. Reading, MA: Addison Wesley, 2003. [E-book] Available: Safari e-book.
Journal article	[4] J. U. Duncombe, "Infrared navigation - Part I: An assessment of feasability," <i>IEEE Trans</i> . <i>Electron. Devices</i> , vol. ED-11, pp. 34-39, Jan. 1959.
eJournal (from database)	[5] H. K. Edwards and V. Sridhar, "Analysis of software requirements engineering exercises in a global virtual team setup," <i>Journal of Global Information Management</i> , vol. 13, no. 2, p. 21+, April-June 2005. [Online]. Available: Academic OneFile, http://find.galegroup.com. [Accessed May 31, 2005].
eJournal (from internet)	[6] A. Altun, "Understanding hypertext in the context of reading on the web: Language learners' experience," <i>Current Issues in Education</i> , vol. 6, no. 12, July 2003. [Online]. Available: http://cie.ed.asu.edu/volume6/number12/. [Accessed Dec. 2, 2004].
Conference paper	[7] L. Liu and H. Miao, "A specification based approach to testing polymorphic attributes," in Formal Methods and Software Engineering: Proceedings of the 6th International Conference on Formal Engineering Methods, ICFEM 2004, Seattle, WA, USA, November 8-12, 2004, J. Davies, W. Schulte, M. Barnett, Eds. Berlin: Springer, 2004. pp. 306-19.
Conference proceedings	[8] T. J. van Weert and R. K. Munro, Eds., Informatics and the Digital Society: Social, ethical and cognitive issues: IFIP TC3/WG3.1&3.2 Open Conference on Social, Ethical and Cognitive Issues of Informatics and ICT, July 22-26, 2002, Dortmund, Germany. Boston: Kluwer Academic, 2003.
Newspaper article (from database)	[9] J. Riley, "Call for new look at skilled migrants," <i>The Australian</i> , p. 35, May 31, 2005. [Online]. Available: Factiva, http://global.factiva.com. [Accessed May 31, 2005].

Technical report	[10] J. H. Davis and J. R. Cogdell, "Calibration program for the 16-foot antenna," Elect. Eng. Res. Lab., Univ. Texas, Austin, Tech. Memo. NGL-006-69-3, Nov. 15, 1987.
Patent	[11] J. P. Wilkinson, "Nonlinear resonant circuit devices," U.S. Patent 3 624 125, July 16, 1990.
Standard	[12] <i>IEEE Criteria for Class IE Electric Systems</i> , IEEE Standard 308, 1969.
Thesis/Dissertation	[1] J. O. Williams, "Narrow-band analyzer," Ph.D. dissertation, Dept. Elect. Eng., Harvard Univ., Cambridge, MA, 1993.