DSCI 601 Notes

1. Overview

This session focused on understanding the academic peer review process for conferences and journals. It also covered timelines, evaluation criteria, and strategies for navigating reviews and rebuttals.

---

2. Typical Timelines

Conference Timeline:

- **Abstract Submission:** Late September or early October.
- **Abstract Feedback:** End of October.
- **First Draft Submission:** Mid-November.
- **Reviewer Feedback:** Late November or early December.
- **Final Decisions:** By December 20th.
- **Publication:** First week of January.

Journal Timeline:

- Journals allow for more iterative processes:
  - Authors submit revised drafts addressing reviewers' feedback.
  - Editors may seek additional reviews or override decisions.
  - There is no direct competition among submissions, unlike conferences.

---

3. Hierarchies of Venues

Conferences:

- **Top-Tier Conferences:**
  - Machine Learning: NeurIPS, ICML.
  - Artificial Intelligence: AAAI, IJCAI.
  - Computer Vision: CVPR, ICCV.
  - NLP: EMNLP, ACL, NAACL.
- **Tier-2 Conferences:** Suitable for borderline Tier-1 papers or rushed submissions.
- **Workshops:** Early-stage work for quick feedback and refinement.

Journals:

- **Top-Tier Journals:**
  - *Artificial Intelligence Journal (AIJ)*
  - *Journal of Machine Learning Research (JMLR)*
  - *Transactions on Machine Learning*.
- **Broad Science Journals:**
  - *Nature*, *Science*, *PNAS*, *Cell*.
  - Focused on groundbreaking interdisciplinary research.

Key Notes:

- **Workshops and Tier-2 Conferences:**
  - Good for feedback and refining work for future submissions.
- **Journal Submissions:**
  - Some journals directly invite extended versions of top conference papers.
- **Rapid Publishing in Computer Science:**
  - Conferences are preferred due to the fast-paced nature of the field.

---

4. Visibility in Peer Review

Single-Blind Review:

- Reviewers know the authors, but authors do not know the reviewers.
- **Advantages:**
  - Prevents retaliation or undue influence.

Double-Blind Review:

- Neither authors nor reviewers know each other's identities.
- **Advantages:**
  - Reduces biases (e.g., based on gender, reputation, or institution).
- **Challenges:**
  - Raises questions about reviewers' expertise and feedback quality.

Senior Reviewer Roles:

- Area chairs and senior program committee members can view all reviewers' identities to ensure proper expertise and oversight.

---

5. Review Process

Conferences:

1. **Paper Bidding:**
   - Reviewers bid for papers relevant to their expertise.
   - Algorithms match reviewers based on their claimed expertise and prior publications.
2. **Review and Scoring:**
   - Categorical evaluations: "Strong Reject" to "Strong Accept."
   - Consistency in scores (e.g., 6-6-6) is favored over polarized scores (e.g., 10-7-1).
3. **Decision Pipeline:**
   - Reviewers → Program Committee → Senior Program Committee → Area Chair → Conference Chair.
4. **Outcome:**
   - Papers are selected based on aggregate scores and qualitative feedback.

Journals:

- Papers are evaluated individually.
- Authors can submit revised drafts addressing concerns.
- Editors make final decisions and may seek additional reviews if needed.

---

6. Evaluation Criteria

- **Fit to Conference or Journal:** Topic relevance.
- **Originality:** Novel contributions to the field.
- **Reproducibility:** Clear and repeatable methodologies.
- **Writing Quality:** Effective communication of ideas.
- **Ethical Concerns:** Awareness of implications.
- **Literature Review:** Comprehensive and accurate.
- **Future Work Scope:** Opportunities for follow-up research.
- **Technical Soundness:** Rigor of methods and analysis.
- **Potential Social Impact:** Broader implications for society.

---

7. Challenges in Peer Review

- **Increasing Submission Volume:**
  - Conferences like NeurIPS and AAAI now receive thousands of submissions.
  - High submission rates lead to a strain on reviewers, including inexperienced participants.
- **Bad Reviews on Groundbreaking Work:**
  - Examples:
    - Alan Turing’s 1937 paper on computing machines was dismissed as "bizarre."
    - The relational database model faced skepticism for its practicality.
    - RSA encryption was deemed "impractical," despite becoming foundational to cryptography.

---

8. Strategies for Authors

Writing a Good Paper:

- Start early to avoid last-minute issues.
- Write with a broader audience in mind, including those outside your specialization.

Rebuttals:

- **Do’s:**
  - Address all points raised by reviewers respectfully.
  - Correct factual errors and misunderstandings.
  - Promise changes that appear minor but impactful.

    - Highlight positive feedback while tactfully addressing criticism.
- **Don'ts:**
    - Ignore any reviewer concerns.
    - Engage in philosophical debates.
    - Overpromise results or suggest significant new experiments.

Tools for Authors:

1. Write a strong, clear, and impactful paper.
2. Respond strategically to reviews, considering all reviewers and the meta-reviewer.
3. Engage the meta-reviewer or editor if reviews are egregiously poor.
4. Accept rejection as part of the process and resubmit elsewhere.

---

9. Personal Case Study: A Career-Changing Paper

A personal example was shared to highlight the critical role of rebuttals in academic success:

- **Paper Submission:**
    - The author's first conference paper was submitted during their master's program.
    - The paper proposed novel methods for local search optimization, advancing the state of the art in its domain.
- **Reviewer Feedback:**
    - Some reviewers criticized the paper, stating it lacked novelty and was too similar to prior work.
    - Others misunderstood the main contributions, focusing on minor issues.
- **Rebuttal Process:**
    - The author crafted a detailed rebuttal, addressing factual inaccuracies and emphasizing the paper's broader contributions, such as a new approach to algorithm design.
    - They tactfully pointed out reviewers who recognized the paper's merits, balancing criticism and support.
- **Outcome:**
    - The paper was accepted after the rebuttal.
    - It became a foundational work, with over 250 citations and multiple awards.
- **Impact on Career:**
    - The paper was instrumental in securing a Ph.D. admission at Carnegie Mellon University.
    - It contributed to the author's involvement in a multi-billion-dollar auction design system and helped secure a faculty position.
    - The success underscored how a strong rebuttal can change the trajectory of an academic career.

---

10. Conclusion

- Peer review is a critical yet imperfect system.
- Authors must navigate it with preparation, strategic responses, and resilience.
- A strong rebuttal can significantly influence outcomes and academic trajectories.

Questions and Comments

Feel free to discuss any unclear points or share your thoughts on the process.