



# **WINS Lab Byzantine Presentation**

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March 27, 2024

# Outline of the Presentation

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- 2 The Contribution
- 3 Motivation/Importance
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# Trust and Reliability in Distributed Networks

The narrative of the Byzantine Generals Problem elegantly encapsulates the essence of trust and reliability in distributed networks.

It sheds light on the fundamental challenge of designing systems robust enough to withstand the uncertainties and potential betrayals inherent in their operation, ensuring that the 'loyal' nodes can still function and agree on a common course of action, even in the presence of disruptive forces.

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# What is the solution/contribution

- **Innovative Protocol Enhancements:** Developed new techniques that improve the efficiency and reliability of Byzantine fault-tolerant protocols, based on the foundational work of Bracha, Toueg, Lamport, Shostak, and Pease.
- **Real-world Testing and Validation:** Conducted rigorous evaluations in simulated real-world conditions to measure the performance and resilience of these enhanced protocols.
- **Practical Implementation Framework:** Created a guideline for implementing these protocols in current distributed systems, ensuring they are both practical and scalable.

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# Motivation/Importance

Trying to reach agreement in systems with Byzantine faults is a complex task, requiring smart and creative solutions. This work is more than just a technical need; it is a vital effort to keep our digital and decentralized world stable and trustworthy. BFT acts as a crucial support for the smooth and secure running of modern technology, pushing us to not just understand it but to improve this key area.

- **Byzantine fault tolerance (BFT) is extremely important for the reliability and safety of distributed systems, which are essential for key areas like banking, health services, and government work. Getting BFT right means building strong networks that can handle failures and threats without breaking down, keeping services running smoothly and data safe. The importance of solving BFT is huge: if we succeed, we make our digital world stronger, but if we fail, we could face serious system failures, data risks, and lose trust in our digital systems.**



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# Model, Definitions

## Formal definition of a Stochastic Process

The use of terminology and jargon should be kept to a minimum, but is impossible to avoid entirely. All terms must be introduced early. It is also useful to remind the audience of the definitions at critical points later in the talk.

Background and this slide can be combined....

# Background

Research is not usually carried out in a vacuum. There will almost always be other relevant or related work, which you should describe. Present an orderly synopsis of these previously- obtained results. A table is often used for this purpose. Be sure to mention the author of each paper and its date of publication. **Compare and contrast them with each other and with your paper.**

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# Main Point 1: A Figure

## Abstract the Major Results

Describe the key results of the paper. You may present the statements of the major theorems, but not their proofs. You will probably have to get a little technical here, but do so gradually and carefully.

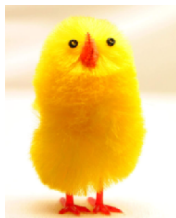


Figure: Awesome Image

# An Example Distributed Algorithm

## Blind Flooding

Blind flooding on an undirected graph is presented in Algorithm 1.

**Implements:** BlindFlooding **Instance:** cf

**Uses:** LinkLayerBroadcast **Instance:** lbc

**Events:** Init, MessageFromTop, MessageFromBottom

**Needs:**

**OnInit:** () do

**OnMessageFromBottom:** (  $m$  ) do

1: Trigger lbc.Broadcast (  $m$  )

**OnMessageFromTop:** (  $m$  ) do

2: Trigger lbc.Broadcast (  $m$  )

**Algorithm 1:** BlindFlooding algorithm

# Main Point 2

## Explain the Significance of the Results

Pause, and explain the relationships between the formal theorems that you have just presented and the informal description that you gave in the Introduction. Make it clear to the audience that the results do live up to the advance publicity. If the statements of the theorems are very technical then this may take some time. It is time well-spent.

# Main Point 3

## Sketch a Proof of the Crucial Results

The emphasis is on the word “sketch”. Give a very high-level description of the proofs, emphasizing the proof structure and the proof techniques used. If the proofs have no structure (in which case it may be assumed that you are not the author of the paper), then you must impose one on them. Gloss over the technical details. It is a good idea to point them out but not to explore them.



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# Main Result 1

Choose **just the key results**. They should be important, non-trivial, should give the flavour of the rest of the technical details and should be presentable in a relatively short period of time. Use figures instead of tables instead of text.

Better to present 10% the entire audience gets than 90% nobody gets

# Main Result 2

Try a subtitle

- Make sure your notation is clear and consistent throughout the talk. Prepare a slide that explains the notation in detail, in case that is needed or if somebody asks.
- Always label all of your axes on graphs; use short but helpful captions on figures and tables. It is also very useful to have an arrow on the side which clearly shows which direction is considered better (e.g., "up is better").
- If you have experimental results, make sure you clearly present the experimental paradigm you used, and the details of your methods, including the number of trials, the specific analysis tools you applied, significance testing, etc.
- The talk should contain at least a brief discussion of the limitations and weaknesses of the presented approach or results, in addition to their strengths. This, however, should be done in an objective manner – don't enthusiastically put down your own work.

# Main Result 3

- If time allows, the results should be compared to the most related work in the field. You should at least prepare one slide with a summary of the related work, even if you do not get a chance to discuss it. This will be helpful if someone asks about it, and will demonstrate your mastery of the material.
- Spell check again.
- Give for each of the x-axis, y-axis, and z-axis
- Label, unit, scale (if log scale)
- Give the legend
- Explain all symbols
- Take an example to illustrate a specific point in the figure

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# Conclusions

Hindsight is Clearer than Foresight

Advices come from [?].

- You can now make observations that would have been confusing if they were introduced earlier. Use this opportunity to refer to statements that you have made in the previous three sections and weave them into a coherent synopsis. You will regain the attention of the non- experts, who probably didn't follow all of the Technicalities section. Leave them feeling that they have learned something nonetheless.
- Give Open Problems It is traditional to end with a list of open problems that arise from your paper. Mention weaknesses of your paper, possible generalizations, and indications of whether they will be fruitful or not. This way you may defuse antagonistic questions during question time.
- Indicate that your Talk is Over An acceptable way to do this is to say "Thank-you. Are there any questions?"[?]

# References

# How to prepare the talk?

Please read <http://larc.unt.edu/ian/pubs/speaker.pdf>

- The Introduction: Define the Problem, Motivate the Audience, Introduce Terminology, Discuss Earlier Work, Emphasize the Contributions of your Paper, Provide a Road-map.
- The Body: Abstract the Major Results, Explain the Significance of the Results, Sketch a Proof of the Crucial Results
- Technicalities: Present a Key Lemma, Present it Carefully
- The Conclusion: Hindsight is Clearer than Foresight, Give Open Problems, Indicate that your Talk is Over



# Questions

THANK YOU

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