Top Ten Mistakes to Avoid in Writing CAREER Proposals

CISE Mixed Advisory Taskforce on Technology, Education, Research and Science (CISE MATTERS)



Number 10: Fonts Too Small

- Small fonts promote reader fatigue
- **Reviewers HATE small** fonts
- **GPG** mandates:
 - 11 point font minimum
 - 1 inch margins
 - 6 lines max per vertical inch

The redundant information sent by a node on its different edges also introduces a dependency between the queues The resumment miorination sent by a more on its gamerent suges also introduces a dependency between the queetes that are not even neighbors. The later complication, while true for RLC, does not inflict itself on every otherwise. For available, a continue or the state of the complication of the complete form this complication. or the nodes that are not even neignours. The later complication, while true for KLA, does not immediately neighbor. For example, a routing scheme with feedback on a general network [68] does not suffer from this complication.

However, while DLC is to not the order of the part of Morever, unlike RLC, it is not throughput optimal. Finally, the intractability of the EMC is compounded by a nonmemoryless output process at each node. Thus, approximation is a more favorable option.

We propose an approximation method that updates a queue for node u considering: 1. The effect of blocking We propose an approximation method that updates a queue for node u considering: 1. The effect of blocking imposed by the next-hop neighbors $N^-(u)$ (on the packets departing from u), and 2. The innovativeness of the packets arriving at u from the previous-hop neighbors $N^+(u)$. Hence, we will only consider the dependency of the department of the constant u from the previous-hop neighbors u to the state of the queues corresponding to notice in $A^+(u)$. parameter stativing as a from the previous map beginners N (a), thence, we will only consule the dependency of the state transition probabilities of the queue for each node u to the state of the queues corresponding to node in N (a). state transition probabilities of the queue for each node u to the state of the queues corresponding to nodes in $N^{\infty}(u)$ and $N^{-}(u)$. Note that this will be exact for most of the schemes on a general network as well as when RLC is applied on a line network 5. The main idea of the approximation framework is to divide the multi-dimensional MC with the property of the propert appixed on a nine network. The main side of the approximation transvork is to divide the indust-unificiational with multiple reflections into multiple simple MCs whose steady-state probabilities can be calculated independently. with multiple rejections into multiple simple MUs whose steady-state probabilities can be calculated independently.

Note that although each MC process is assumed independent of the other MC processes, the interdependency of the states of their queues are captured by the approximation method via their steady-state probability distributions. In States of their queues are captured by the approximation method via their steady-state probability distributions. In

For any node $u\in V$ and a subset of nodes $S\subset V$, consider the queue For any node $u\in V$ and a subset of nodes $S\subset V$, or any above $u \in v$ and a subset of nodes $x \in V$. Consider the queues required for the analysis by X. Au $_{m\to S(1)}$. We denote the set of an the queues required for the analysis by \mathcal{X} . Note that, each queue $X_{m\to S}(t)\in\mathcal{X}$ must form an irreducible ergodic Markov note that, each queue A_{10} —S(t) $\in \mathcal{A}$ must form an irreducine ergodic started chain whose state transition probabilities must be systematically computable given all the information regarding the communication scheme, buffer managrees as see mormation regarding the communication science, owner management strategy, the erasure probabilities on the links, and the network Figure 4: MC of the capacity o

agement strategy, the erasure probabilities and independent strategy, the erasure probabilities and the most strategy and the absence topology. As a result, all the MCs will have unique steady-star the absence topology. As a result, all the MCs will have unique steady-star the absence topology. distributions which are denoted by $\pi_{u \to S}(\cdot)$, i.e., $\pi_{u \to S}(\cdot)$ distributions which are denoted by $\pi_{n-3(1)}$ because that in general, by means of our approximation method very veyed to the next that in general, by means of our approximation and $X_{u-s}(t)$ depend on the steady-state distributions of $X_{u-s}(t)$ depend on the steady-state distributions of $X_{u-s}(t)$ (see Section 2.2 for arrival and departure of minovasive penales we define multiple incoming and outgoing streams learly independent packet we define multiple incoming and outgoing streams learly independent pack dependent. Let $\Lambda_{u \to S} = \{\lambda_1, \dots, \lambda_{z_n}\}$ be the set the queux $X_{u \to S}(t)$. Similarly, let $\Omega_{u \to S} = \{\mu_1, \dots t\}$ the buffers of the not departing streams. Note that z_n and z_{out} are in the buffers of the not links for node u. Thus, at each epoch, the total number of the probability λ , for i=1. and a non-non-negative such arrival occurs with probability λ_i for $i=1,\ldots$ range from 0 to z_{out} . Hence, at each epoch, given X_u . $\{\max_{n=1}^{\infty} z_{out}, 0\}, \dots, \min_{n=1}^{\infty} \{n_n + z_{on}, m_n\}\}$. Fig. 4. Give than that is similar to the one depicted in Fig. 4. Give define its arrival and departure polynomials as

where $a_k^{(n_k)}$ (and $e_k^{(n_k)}$) can be interpreted as the probability of the event that the number of arrived (and departed) where $a_k^{(n_k)}$ (and $a_k^{(n_k)}$) can be interpreted as the probability of the event that the number of arrived (and departed) are the coefficients of the coefficient where $a_k^{(-)}$ (and $e_k^{(-)}$) can be interpreted as the probability of the event that the number of arrived (and departed) innovative packets to (from) the queue $X_{u-S}(t)$ is equal to k, in an epoch. The superscript on the coefficients represents the current state $X_{u-S}(t) = n_u$. We included this dependency of the arrival and departure polynomials of the current state $X_{u-S}(t) = n_u$. represents the current state $A_{u\rightarrow S}(t)=n_u$. We included this dependency of the arrival and departure polynomials in the current state of queue to account for some cases such as the wireless networks with backpressure routing on the current state of queue to account for some cases such as the wireless networks with backpressure routing on the current state of queue to account for some cases such as the wireless networks with backpressure routing on the current state of queue to account for some cases such as the wireless networks with backpressure routing on the current state of queue to account for some cases such as the wireless networks with backpressure routing on the current state of queue to account for some cases such as the wireless networks with backpressure routing on the current state of queue to account for some cases such as the wireless networks with backpressure routing on the current state of queue to account for some cases such as the wireless networks with backpressure routing on the current state of queue to account for some cases such as the wireless networks with backpressure routing on the current state of queue to account for some cases such as the wireless networks with backpressure routing on the current state of queue to account for some cases such as the wireless networks with backpressure routing of the current state of queue to account for some cases and the current state of queue to account for some cases are considered as a supplication of the current state of queue to account for some cases and the current state of queue to account for some cases and the current state of queue to account state on the current state of queue to account for some cases such as the wireless networks with backpressure routing in Section 3.2. Let $\Delta_{u-S} = \{A^{(n_u)}(x)\}_{m_u=0}^{n_u}$ and $L_{u-S} = \{E^{(n_u)}(x)\}_{m_u=0}^{n_u}$ be the sets of arrival and departure polynomials for the queue $X_{u-S}(t)$, respectively, where m_u is the buffer size of node u. Given Δ_{u-S} and Γ_{u-S} , the queue's state transition probabilities can be easily computed. As an example, for $0 < j < m_u$, we have the following:

$$S(t)$$
, respectively. As an example t if $S(t)$, respectively. (2) gifting can be easily computed. As an example t if $S(t)$ is $S(t)$, respectively. (2) $S(t)$ is $S(t)$, $S(t)$, $S(t)$ is $S(t)$, $S($

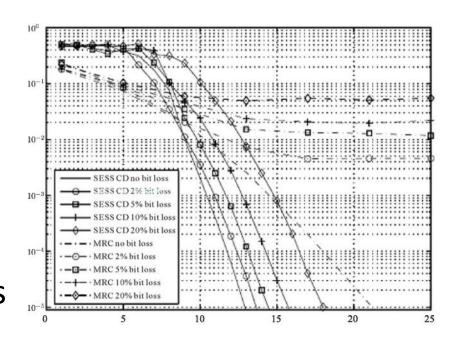
For notational consistency, we can extend $e_k = 0$ for k < 0 or $k > z_{out}$ and $a_k = 0$ for k < 0 or $k > z_{in}$. Note that For nonaturnal consistency, we can extend $e_k = 0$ for $\kappa < 0$ or $\kappa > z_{out}$ and $u_k = 0$ for $\kappa < 0$ or $\kappa > z_{in}$. Note that above equation is slightly different for j = 0 and $j = m_u$, whose details are omitted due to the page limit. As a the problem approximate MC is formed for $Y = c(\lambda)$ with standardate probability distribution $w = c(\lambda)$. the above equation is sugnity dimerent for j=u and $j=m_0$, whose usuals are offered use the programmer result, the proper approximate MC is formed for $X_{u-S}(t)$ with steady-state probability distribution $m_0 = s(t)$.

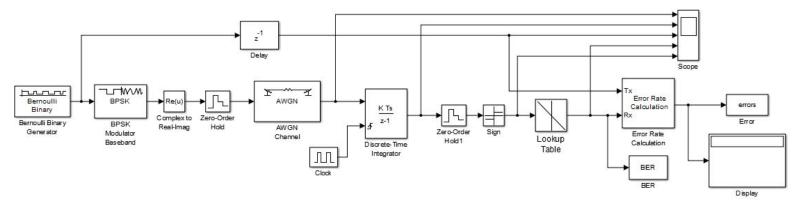
Suc, we proper approximate an $a_{w-S(t)}$ which alone problem, y discussions $a_{w-S(t)}$. In summary, given all the information for the problem, for any node u, one (or multiple) queue with its inoming $a_{w-S(t)}$. in summary, given an one information for one protection, for any node us, one for multiple, queue what are incoming and outgoing streams will be identified properly. Then, the corresponding arrival and departure polynamials will be and outgoing streams will be accumined property. Then, the Corresponding strived and departure polynomials will obtained parametrically. These polynomials describe the state transitions of the queue from which the stackly-state containing the containing strived and the containing strived are the containing strived as the containing strived are the containing strived are the containing strived as the containing strived are the containing strived as the containing strived are the containing strived as the containing strived are the containing strived are the containing strived are the containing strived as the containing strived are the containing strived are the containing strived as the containing strived are the containing strived as the containing strived are the containing strived as the containing strived are the containing strived are the containing strived are the containing strived as the containing strived are the containing strived ar outained parametricary. These polynomials describe the state transitions of the queue from which the steady-state probability distribution can be computed for the MC. Then, we propose the following algorithm, denoted as the probability described in Algorithm (TPA) to compute steady state models like distributions does it contains Programmy user-noneway can be computed for the ARC. Then, we propose the monowing algorithm (EA), to compute steady-state probability distributions for all queues:

ion 3.1 presents an improved approximation for RLC in general networks by considering the interdependency of more queues

Number 9: Figures Illegible

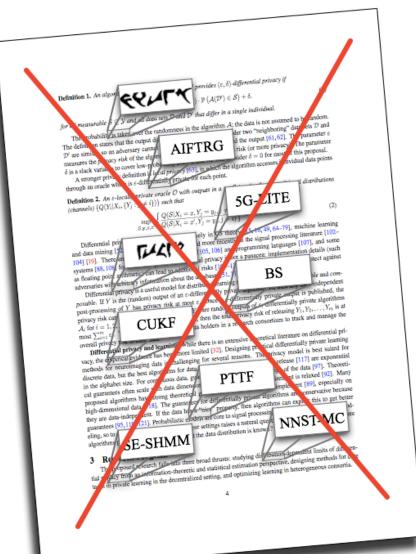
- Avoid "crowded" visuals
- Don't assume reader will print in color
- Use vector graphic formats





Number 8: Acronyms & Abbreviations

- Acronyms are UGLY, and make text hard to read.
- Acronyms limit your audience to those who already know them...



Number 7: Dissing the Competition

- Good idea: Citing others' work
- Bad idea: Slighting others' work



("Others" might be sitting on the panel)

Number 6: Poor distinction between preliminary results and proposed work

- Make a clear demarcation
- Distinguish your results from others'

Provide clear road map for

future work





Number 5: Lackluster Education Plan

- Should be integrated with research plan
- Think beyond your present teaching duties



Number 4: Dull Broader Impacts

- Broader Impacts ask:
 - How will this work change society?
- Don't confuse this with "extracurricular activities" not supported by the research plan
- Outreach plans should be actionable



Number 3: Confining yourself to your PhD work

- CAREER proposal should be forward-looking
- Move above and beyond your PhD work
- "Imagine a world ..."





(yes) (no)

Number 2: "It wasn't clear ..."

Symptoms:

- Long-winded explanations
- Too many superfluous details
- Poor organization of thoughts into words

Remedies:

- Use fewer words
- Read first two pages aloud
- "Make every word tell"



Number 1: Research Plan lacking Cohesion

- Don't staple together unrelated ideas
- Don't offer a laundry list with no prioritization
- Don't make everything look like a nail to your one hammer
- Tell a story with your narrative







Questions?