

Secrets to Lightning-Fast Mobile Design

Warm Gun 2011
Mike Krieger
Instagram

me

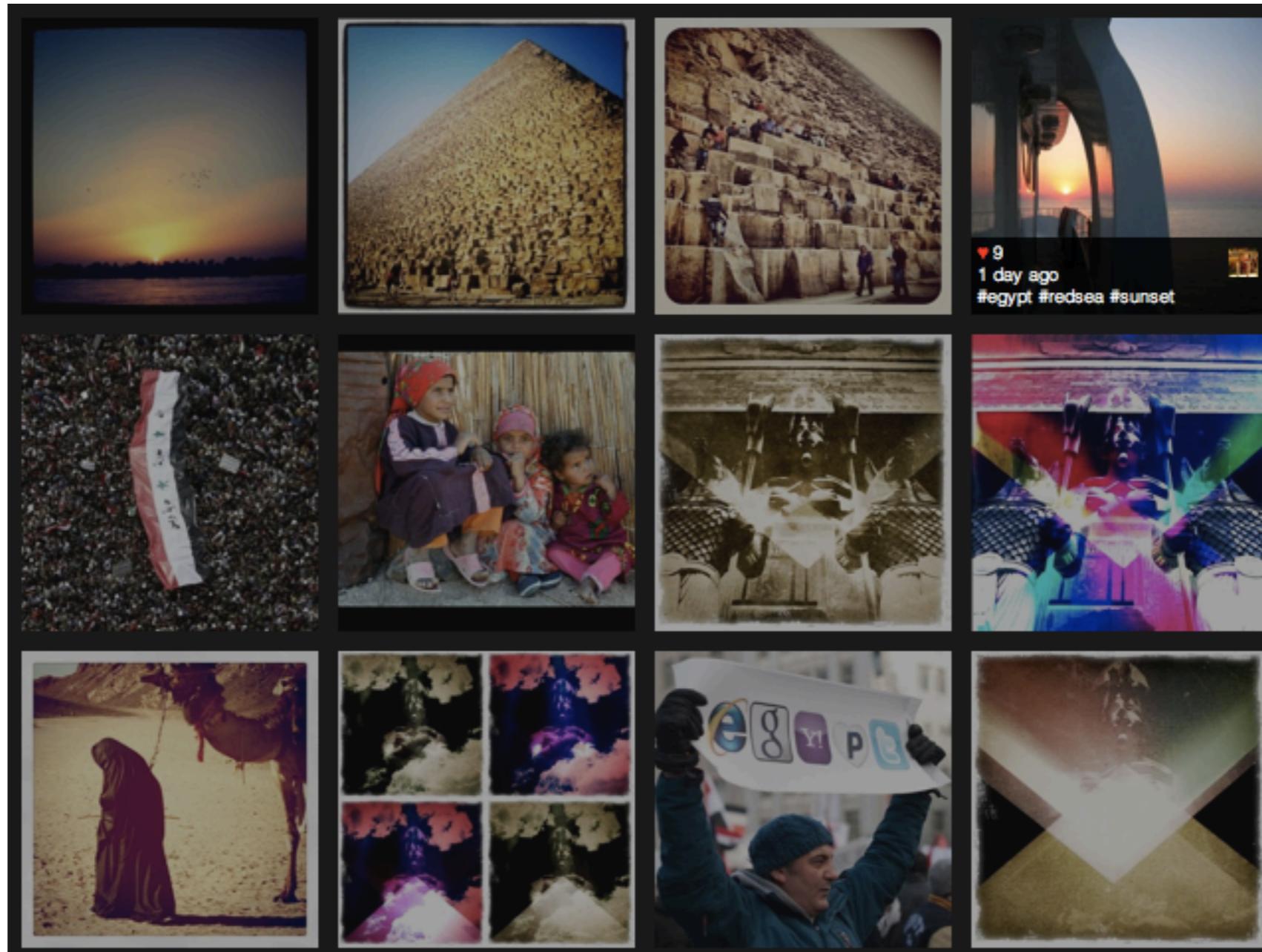
- Co-founder, Instagram
- Previously: UX & Front-end
@ Meebo
- Stanford HCI BS/MS
- @mikeyk on everything





12 million users in 12
months







ntnl

79 photos · 15948 followers



“Fast, beautiful photo
sharing”

“Fast, beautiful photo
sharing”

making your mobile
experiences feel
lightning-fast

not the **code**, but the
experience

mobile design requires
the ultimate in design &
development
collaboration



speed matters

mobile experiences fill
gaps while we wait

no one wants to wait
while they wait

JSON parsing
UITableViewCell
HTTP pipelining

creative design decisions

how speed can be a
design feature

how design can be a
speed feature

implementation details

details that need to be
designed

3 secrets to apps that
feel lightning-fast, even
on 3G

1. perform actions optimistically
2. adaptively pre-load content
3. move bits when no-one's watching

**perform actions
optimistically**

latency is what'll get ya

make the user feel
productive

AT&T

9:37 PM

54%



bill

5h



177 likes

bill

redinc At first I thought it was a
building...very cool photo

graceeflood same ^^^

morenitaenvied Cool pic

like

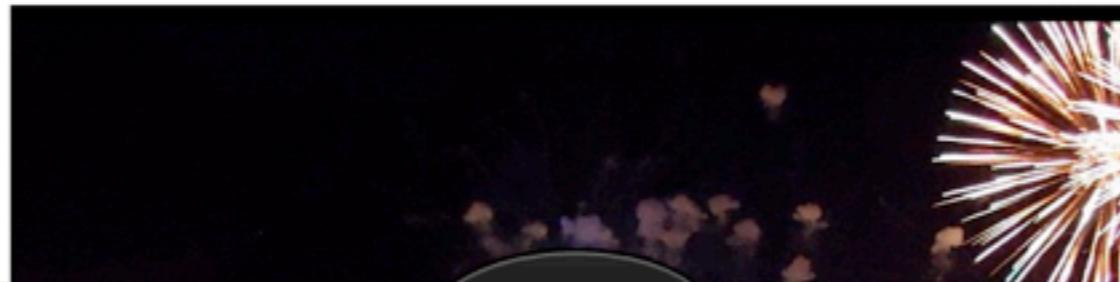
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redbull

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178 likes

bill ☀

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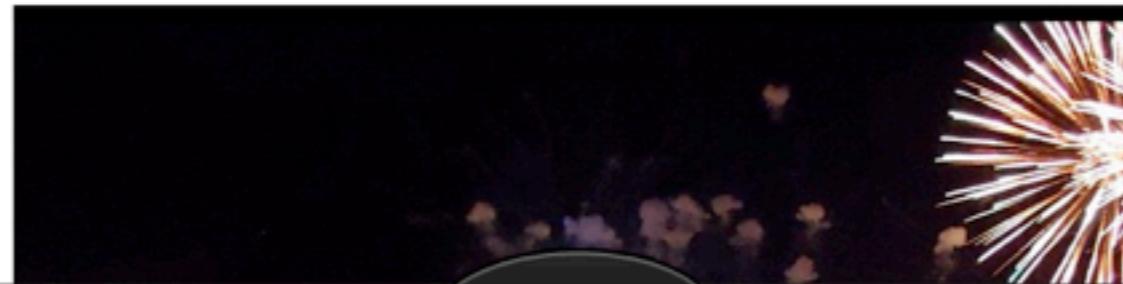
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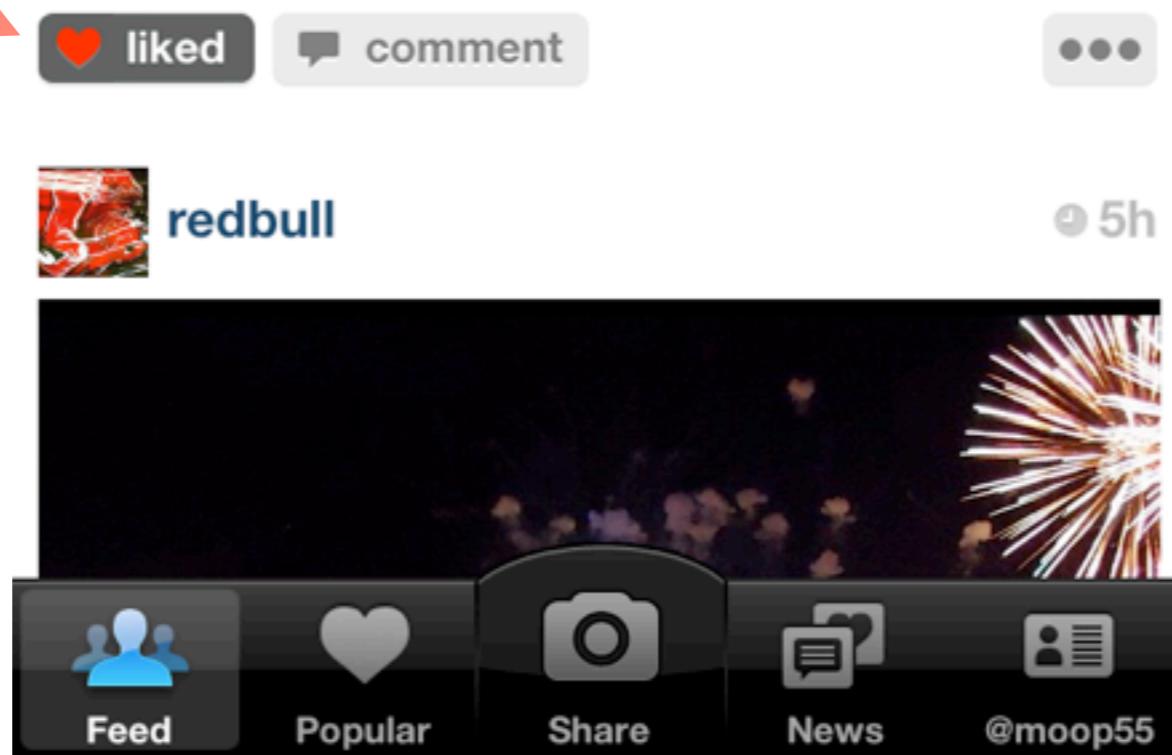
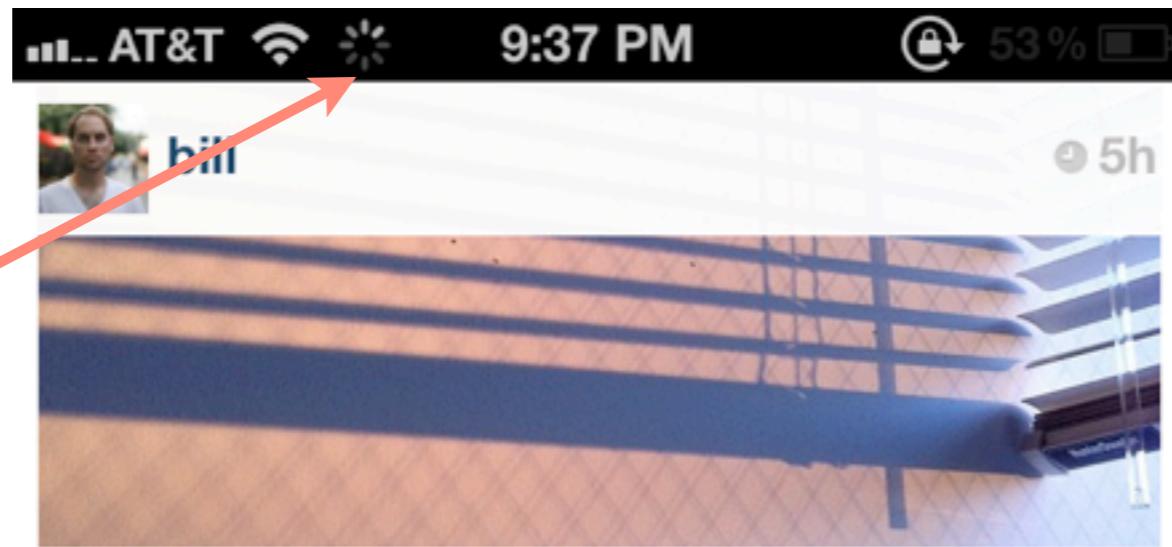


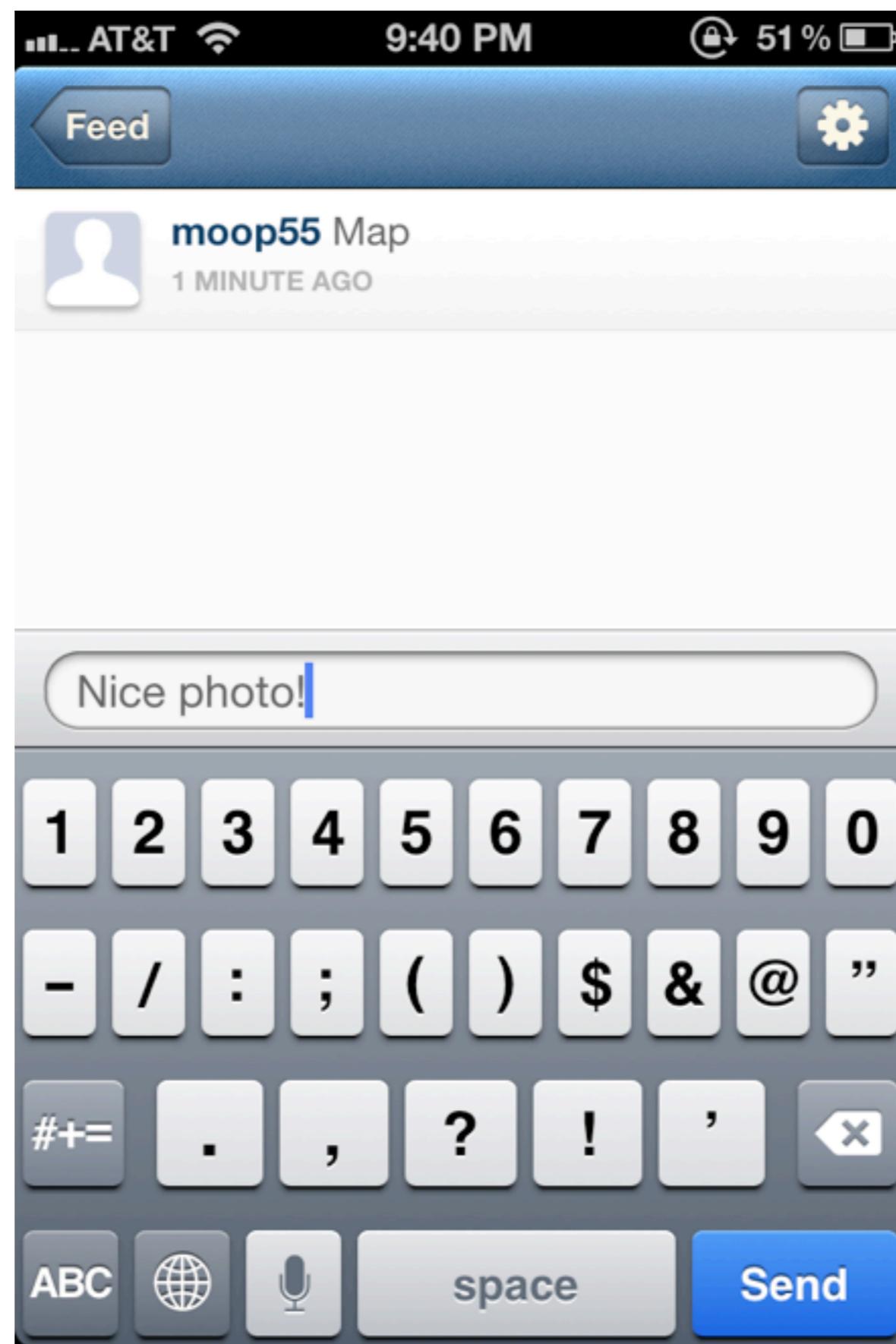
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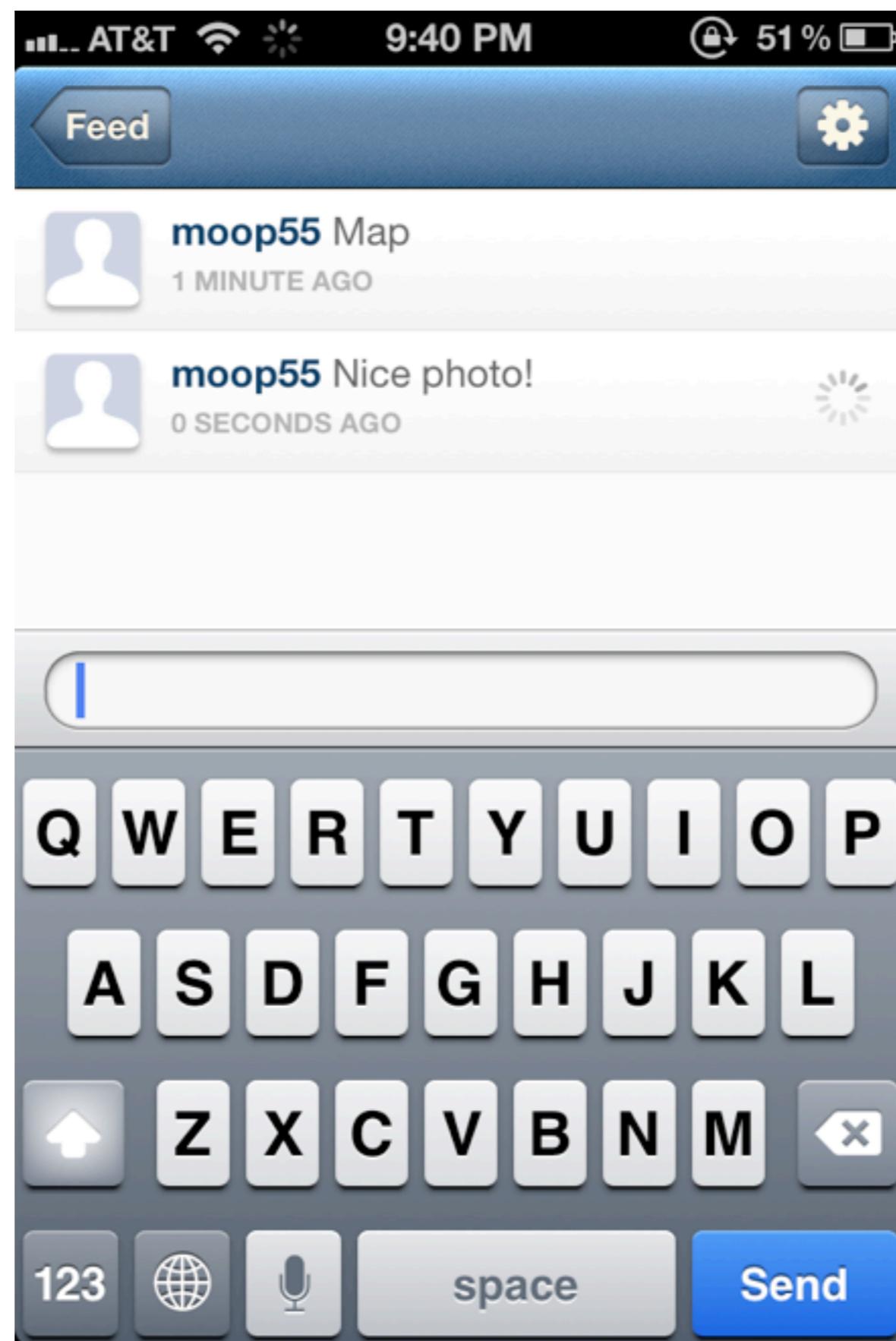


@moop55

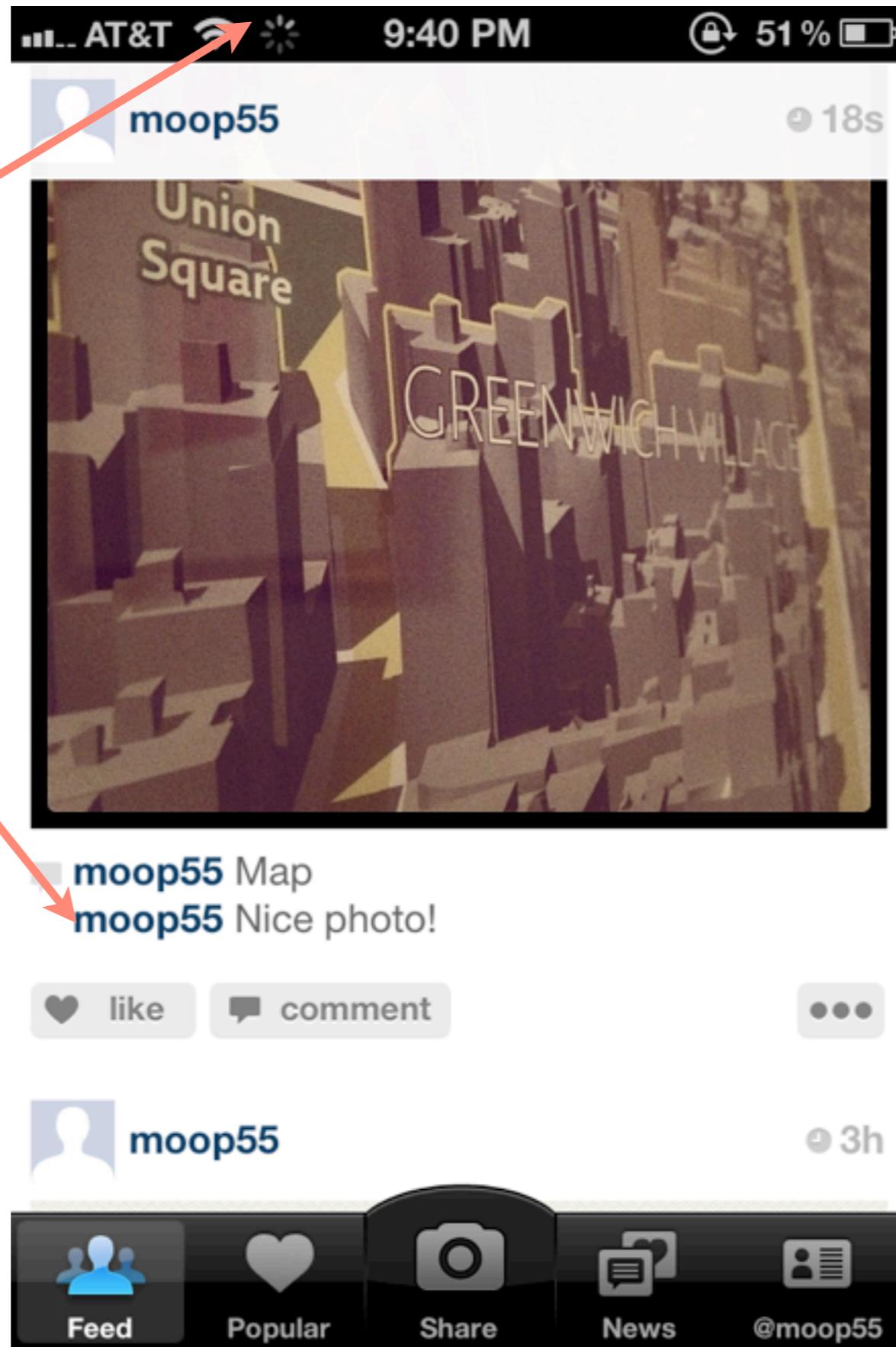
request
is going, but
we register the
like







request
is going, but
we register the
comment



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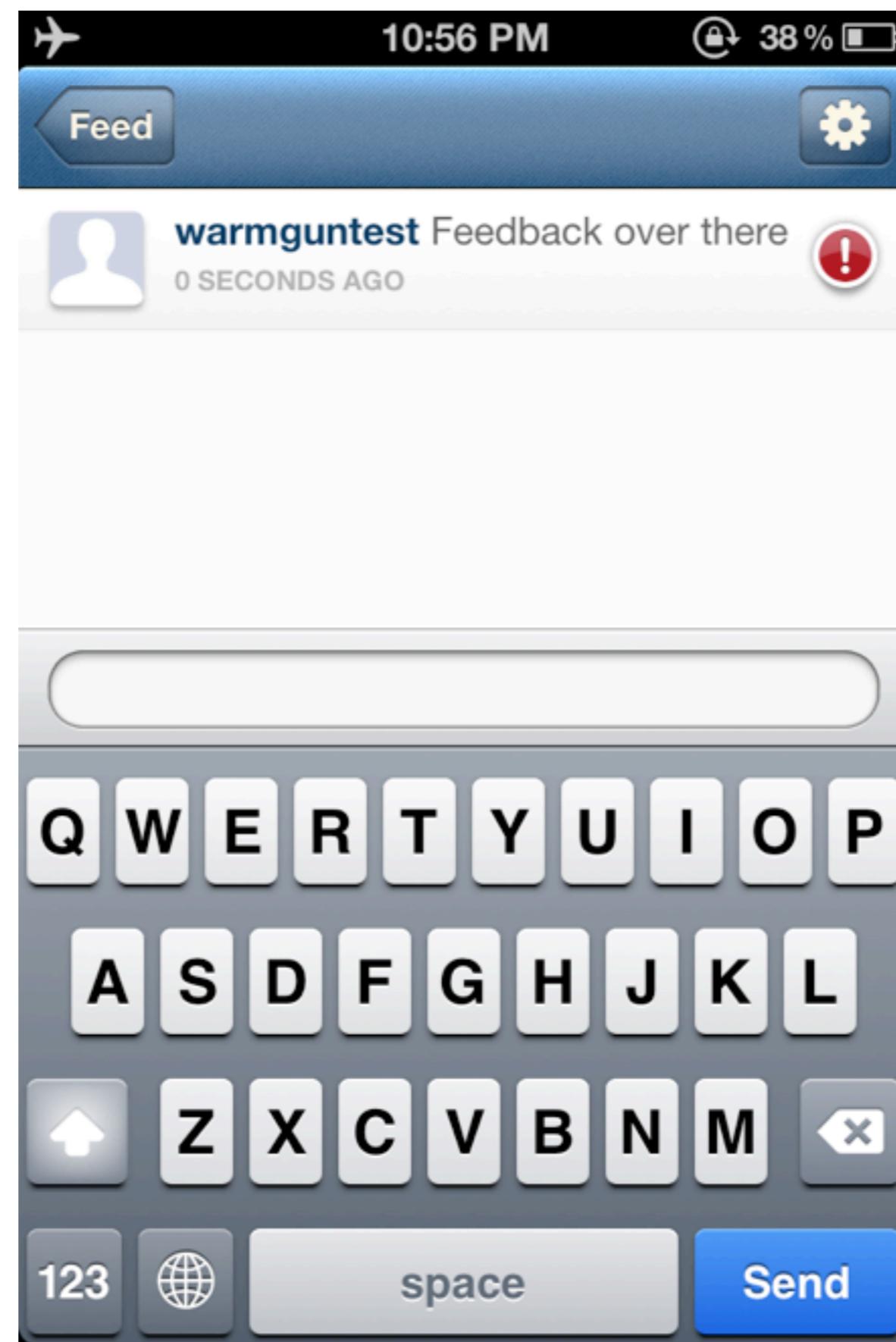
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if it fails?



10:40 PM 41 %

Timeline

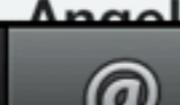
Network Error
Check your network connection. Twitter could also be down.

[uncrunched.com/2011/11/27/sta... @jwz: "No." jwz.org/blog/2011/11/w...](http://uncrunched.com/2011/11/27/sta... @jwz:)

 **Karl Pichotta** 11m
Before I discovered itertools, my python was 30% less magical and 40% more readable.

 **pauloppenheim** 12m
Root shell on a fresh NetBSD install - ps auxww reports 11 processes total. This is a weird new world I've entered.

Angelo DiNardi 12m

why it works



@thesarahnator



@stayintheshade

adaptive pre-loading

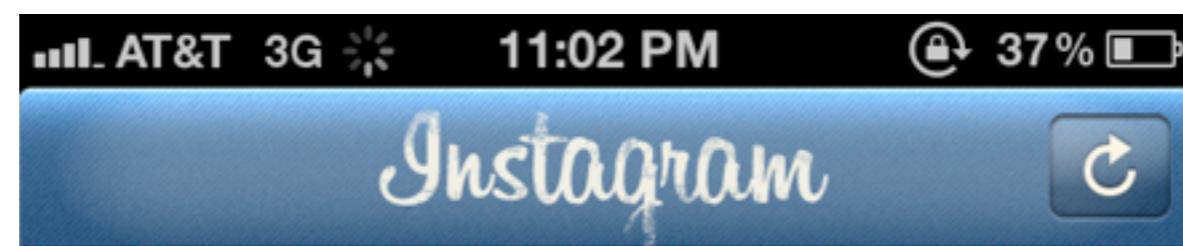
basic version: load
content before it's
needed

“let’s load all the images
in the feed once the user
loads the page”

fresh feed

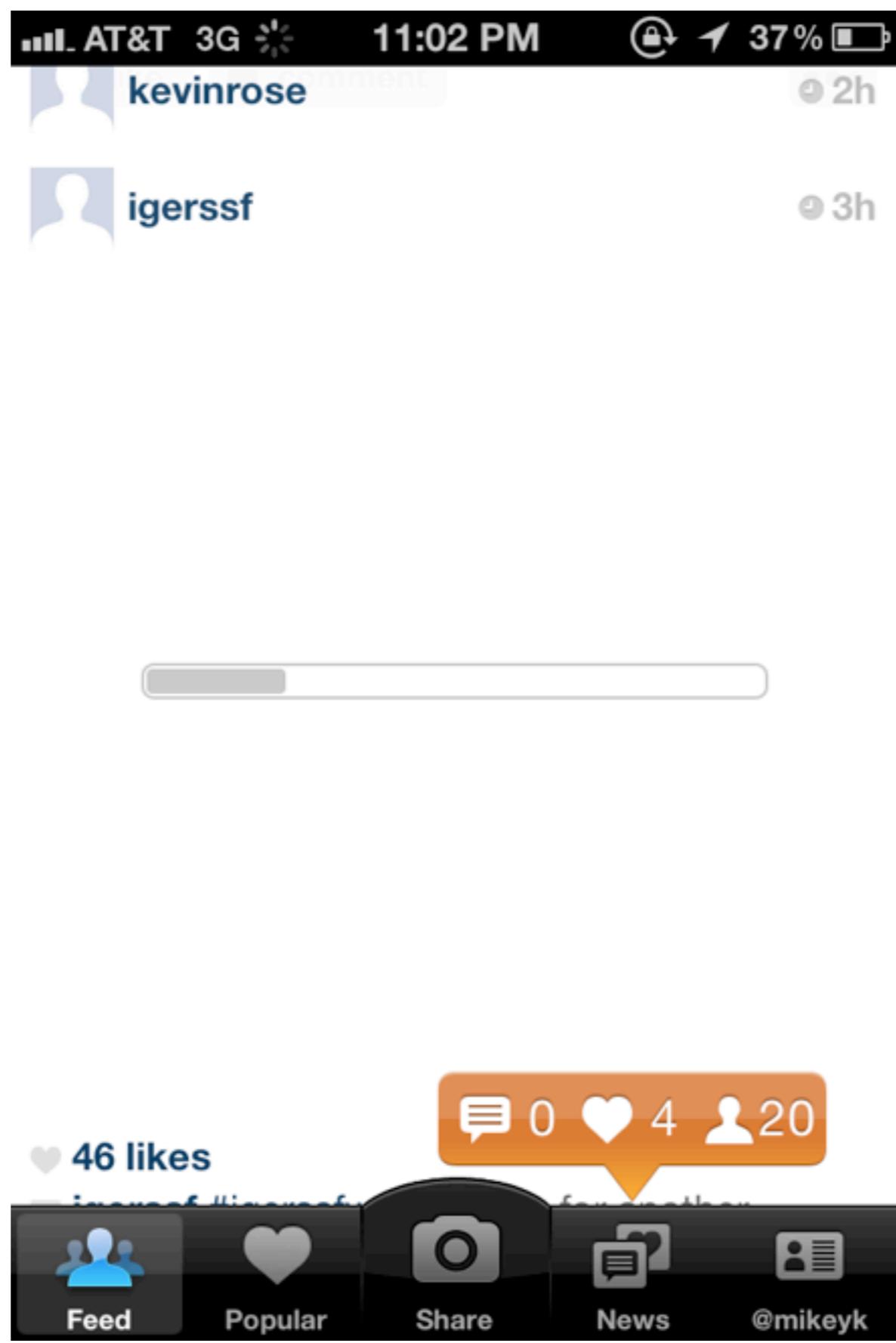
30 photos to load

pitfall



garrett
The San Francisco Dream







AT&T 3G

11:03 PM



36 %



taylorswift

3h

8895 likes

taylorswift Winter = baking season. It's on.

[view all 520 comments](#)**bigbiss** @kelibraddock you know me all to well.**emiswim** Lololol story of my life. I turn into Betty crocker and gain like 30 pounds.**fferrarii** U so beautiful I love u **yossi1976** Wow wow wow **natashajade** #FollowMe and like my pictures pleAse :)!!

liked

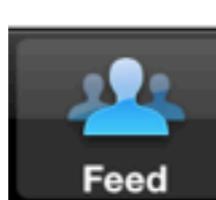


comment



om

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@mikeyk



AT&T 3G

11:04 PM



36 %



kevinrose

3h

223 likes

kevinrose Take pride in what you do.

[view all 17 comments](#)**jasonquiz** The mammoths eye is popping out**randalltodd** As my Dad would say when confronted with this: Quality is job two**claygoetz** Obviously a drunk octopus that wants to fight you**kngtrdr** @randalltodd well said. A Ford man, eh?**craiggrocott** @kevinrose "Don't sweat the small stuff"

like

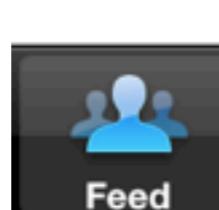


comment

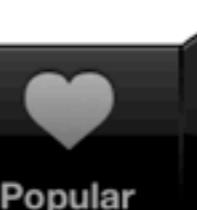


wisequark

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 bs
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0 0 4





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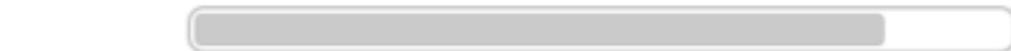
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📍 Palenque Zona Arqueologica 

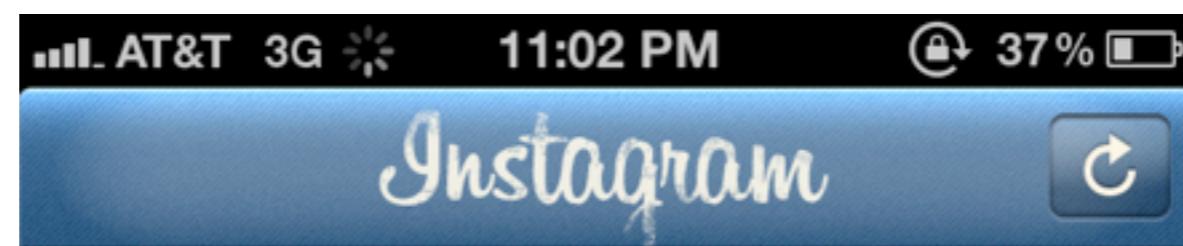
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instead...

re-prioritize based on
interest



garrett Almost a fl Almost December.



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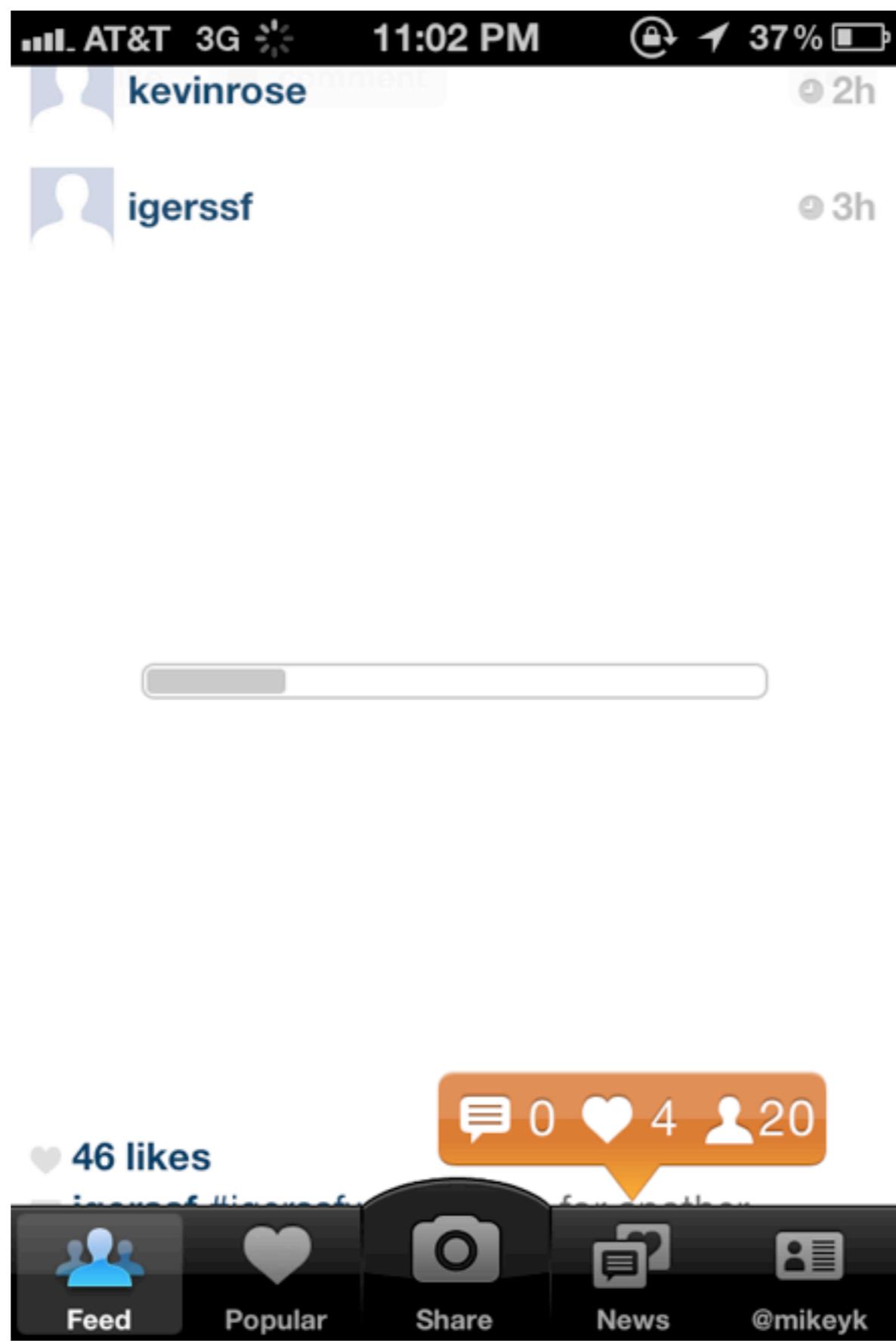
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fferrarii U so beautiful I love u ❤️💋

yossi1976 Wow wow wow 🎂🍰🎂

natashajade #FollowMe and like my pictures pleAse :)!!



liked

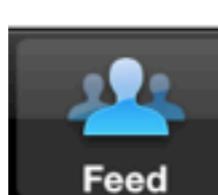


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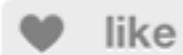


kevinrose

3h

223 likes

kevinrose Take pride in what you do.

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like

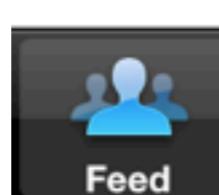


comment



wisequark

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@mikeyk



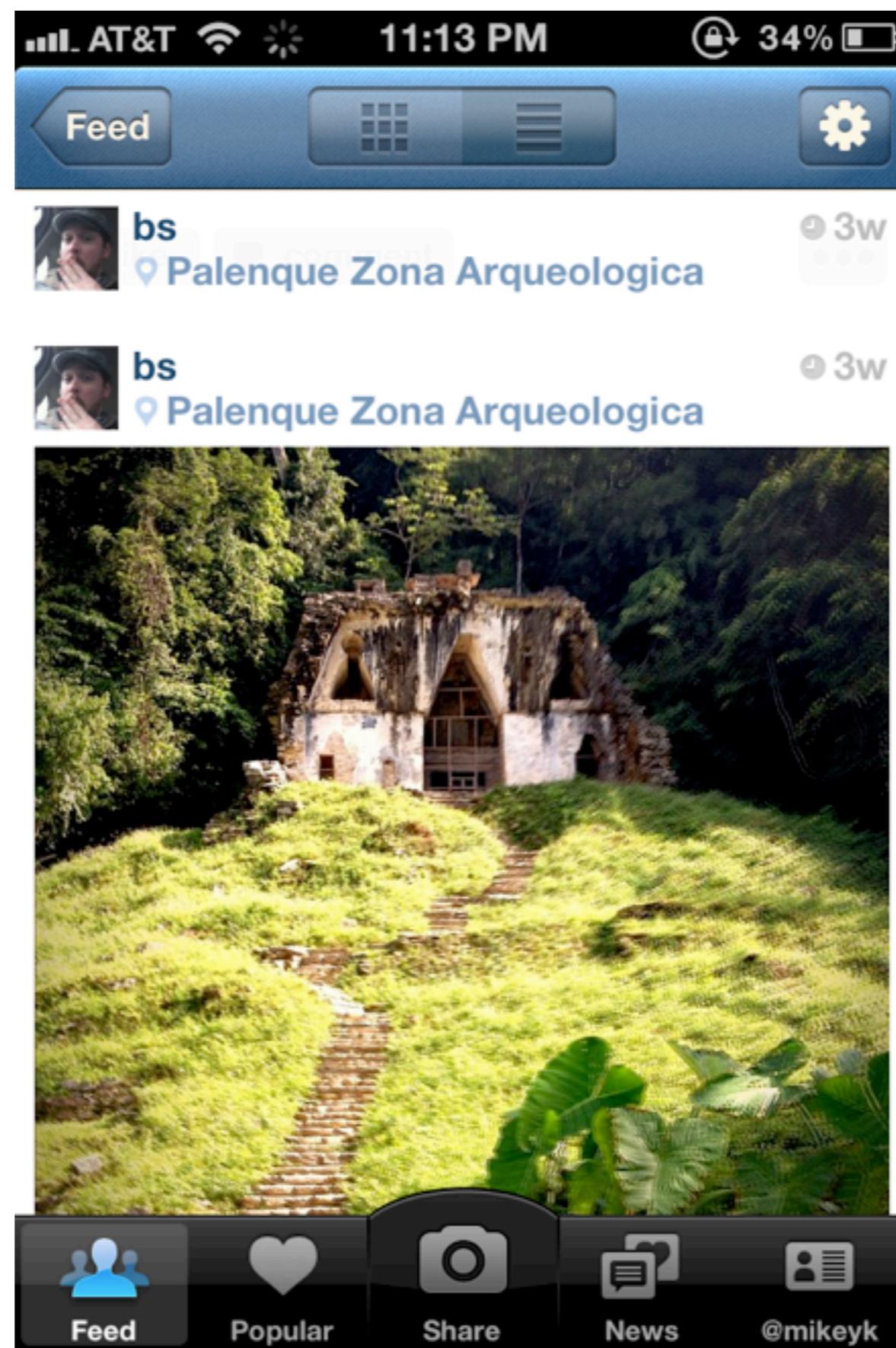
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📍 Palenque Zona Arqueologica 

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0 0 4





listen to what their flicks
& taps are telling you

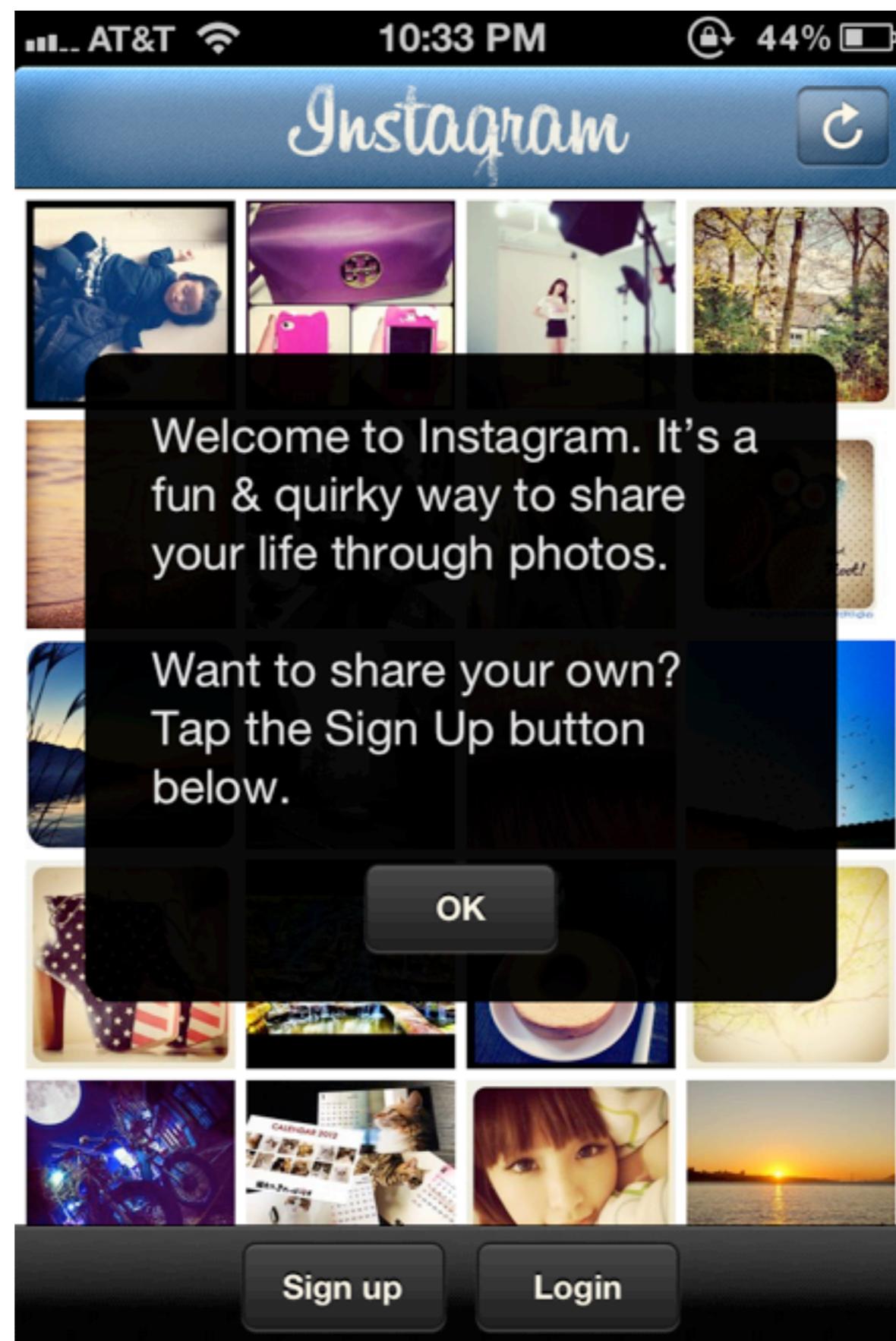
why it works

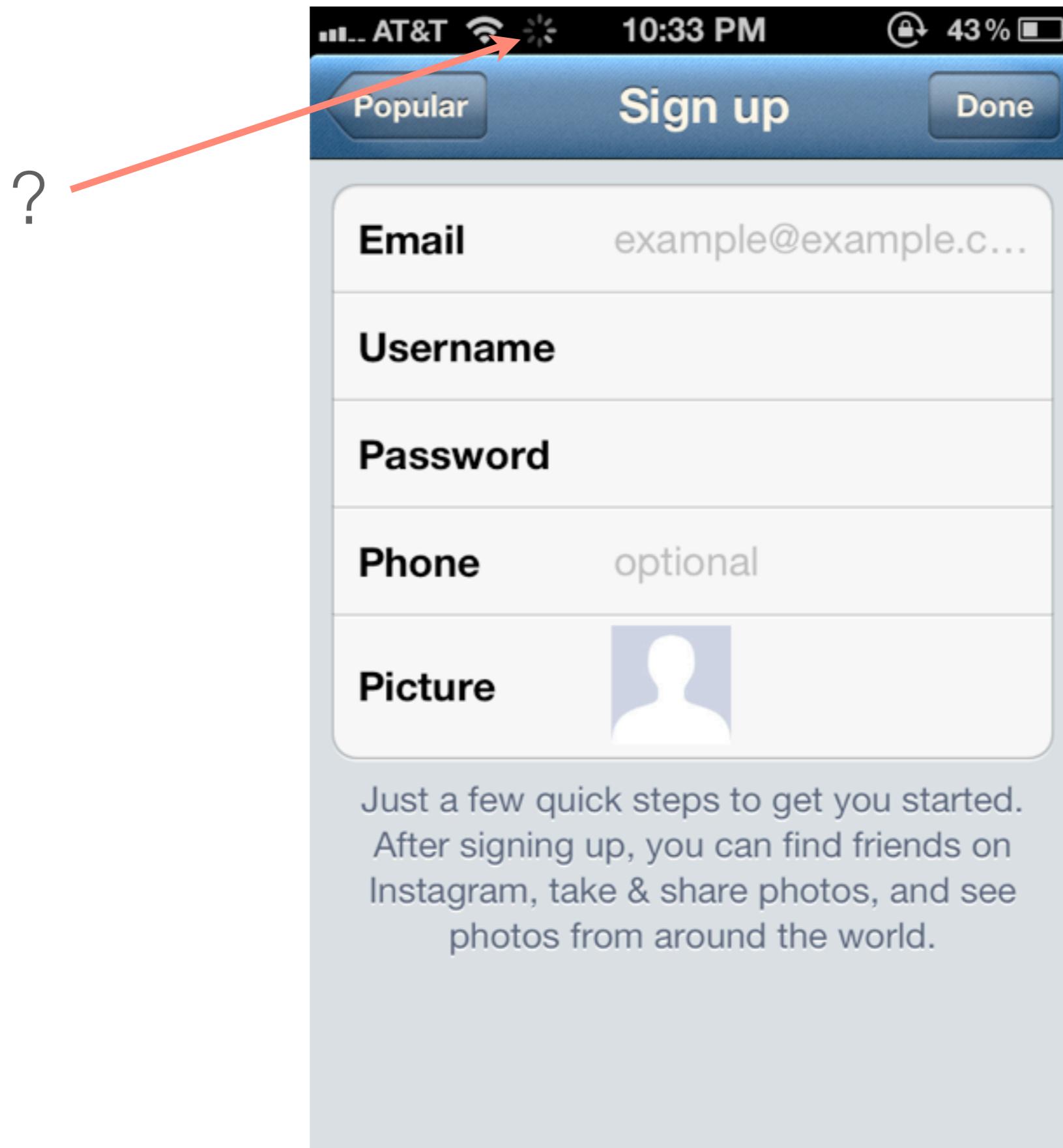


@miriamjasmine

move bits when
no-one's watching

sign-up





AT&T 10:33 PM 43%

Popular Sign up Done

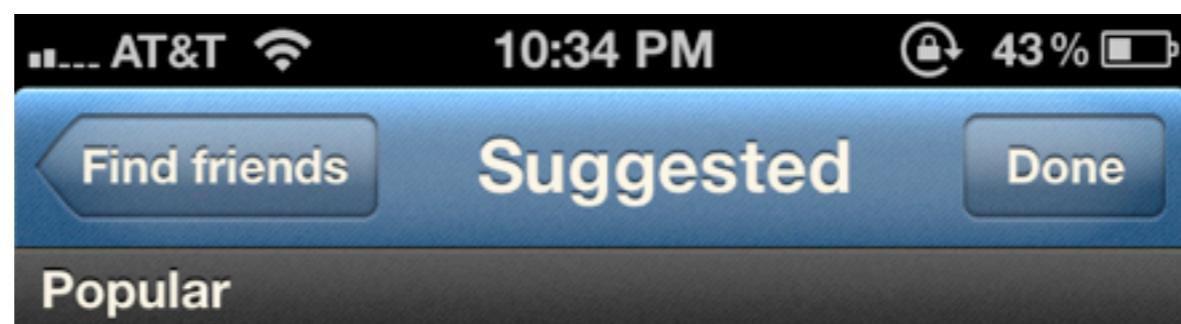
Email hello@example.com

Username warmguntest

Password ••••••••

Phone optional

1	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PQRS	8 TUV	9 WXYZ
+ * #	0	✖



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 **gabeg** Follow

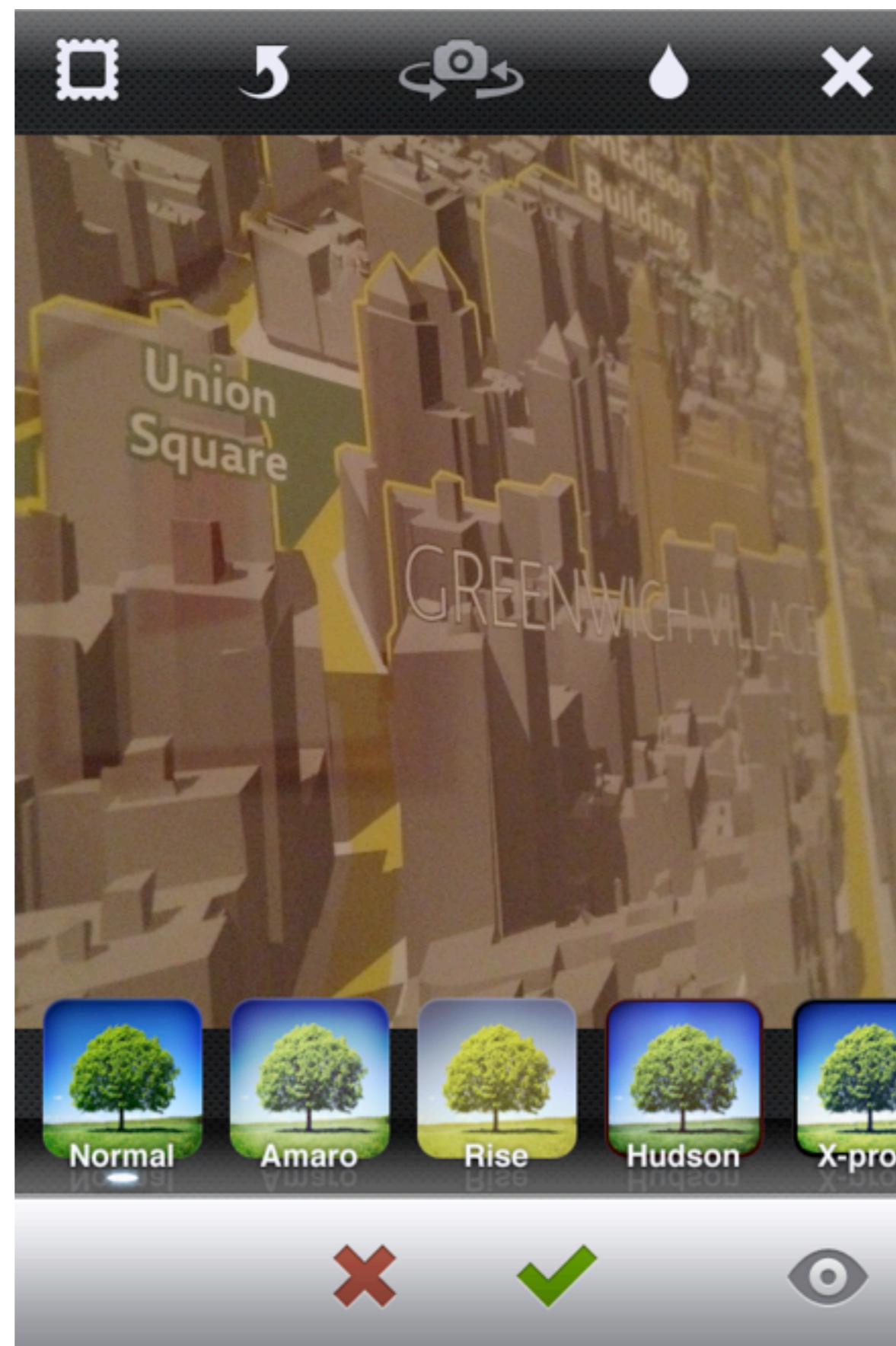


Photocommuting Portland by bike, stuck in the library most of the rest of the time.

 **chrysti** Follow

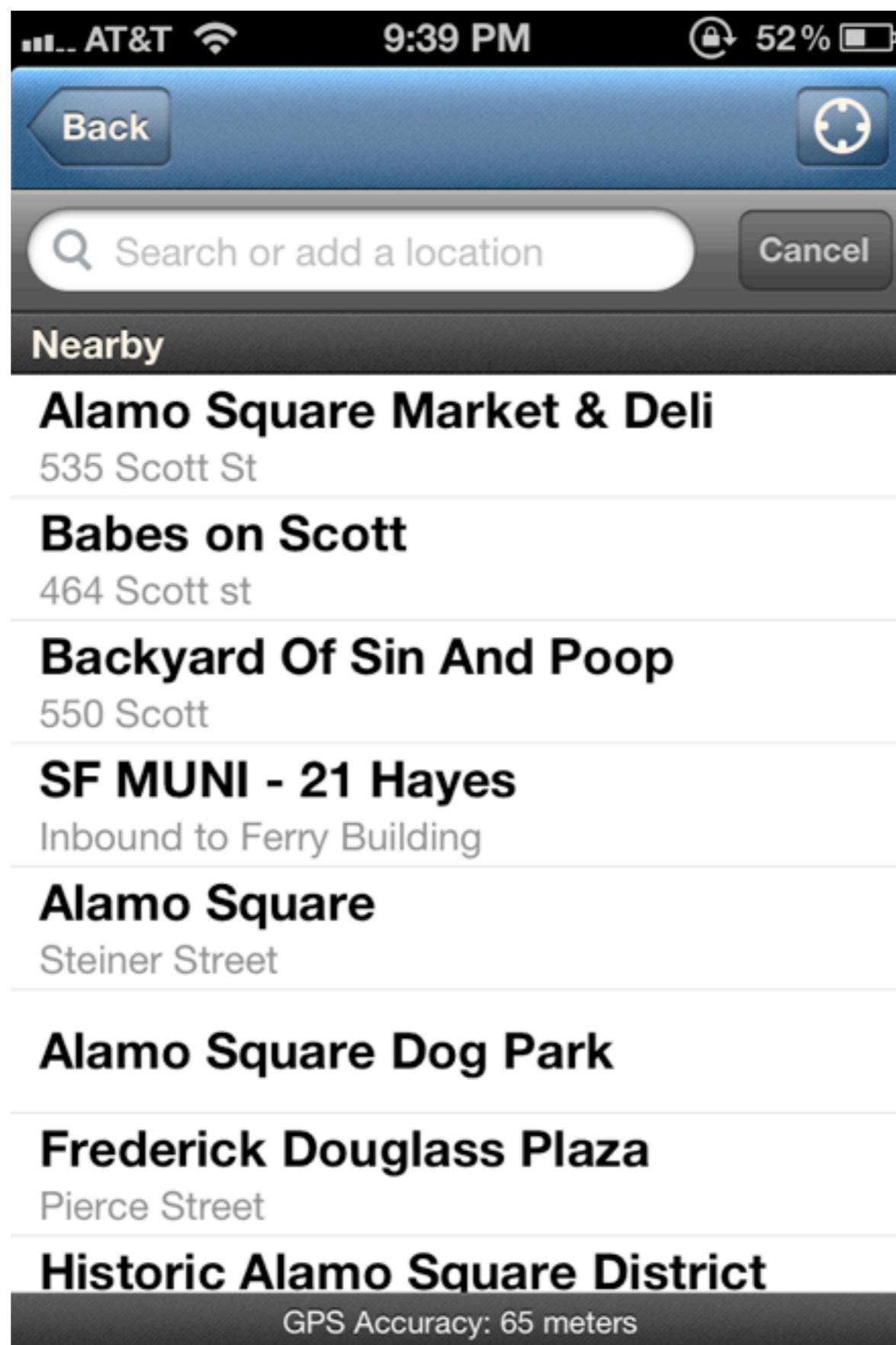


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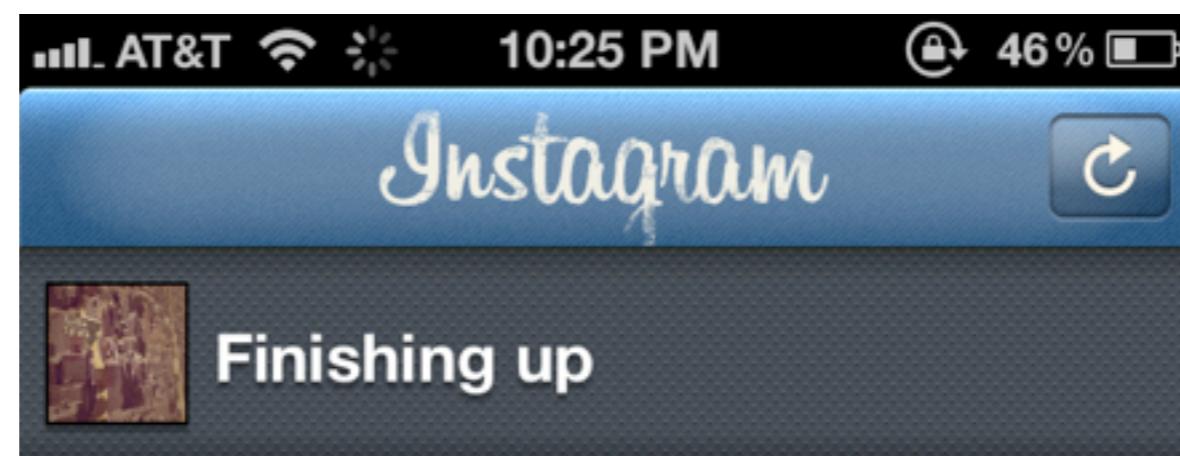






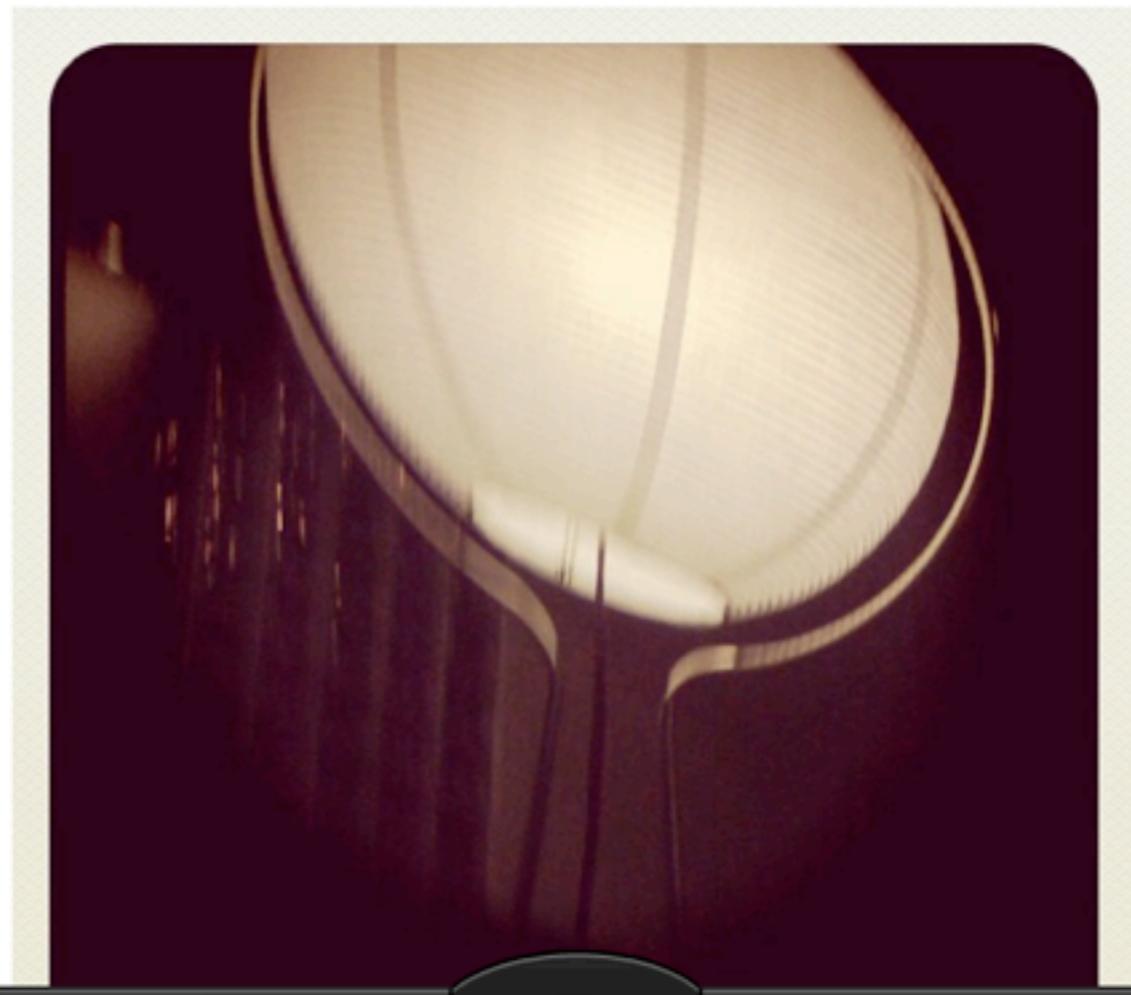


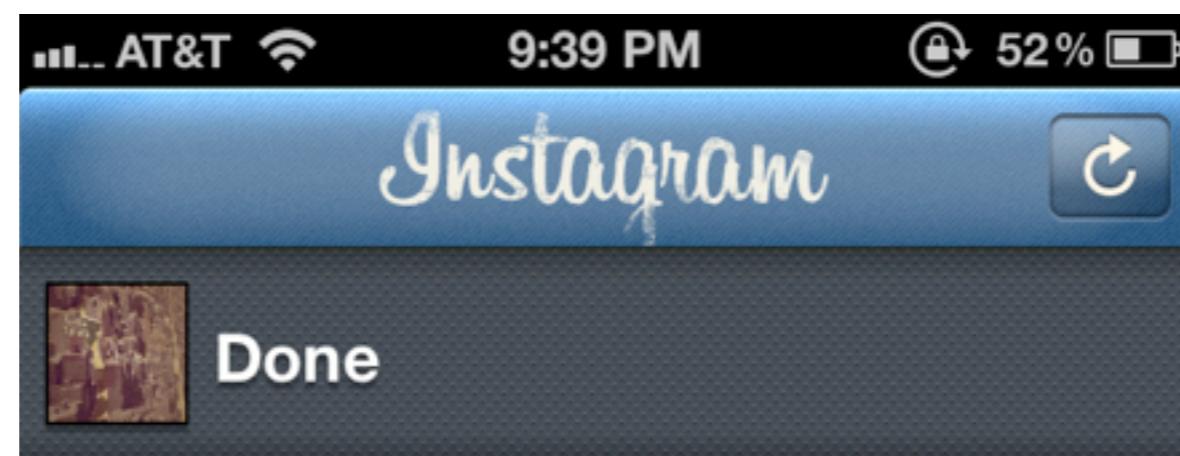




moop55

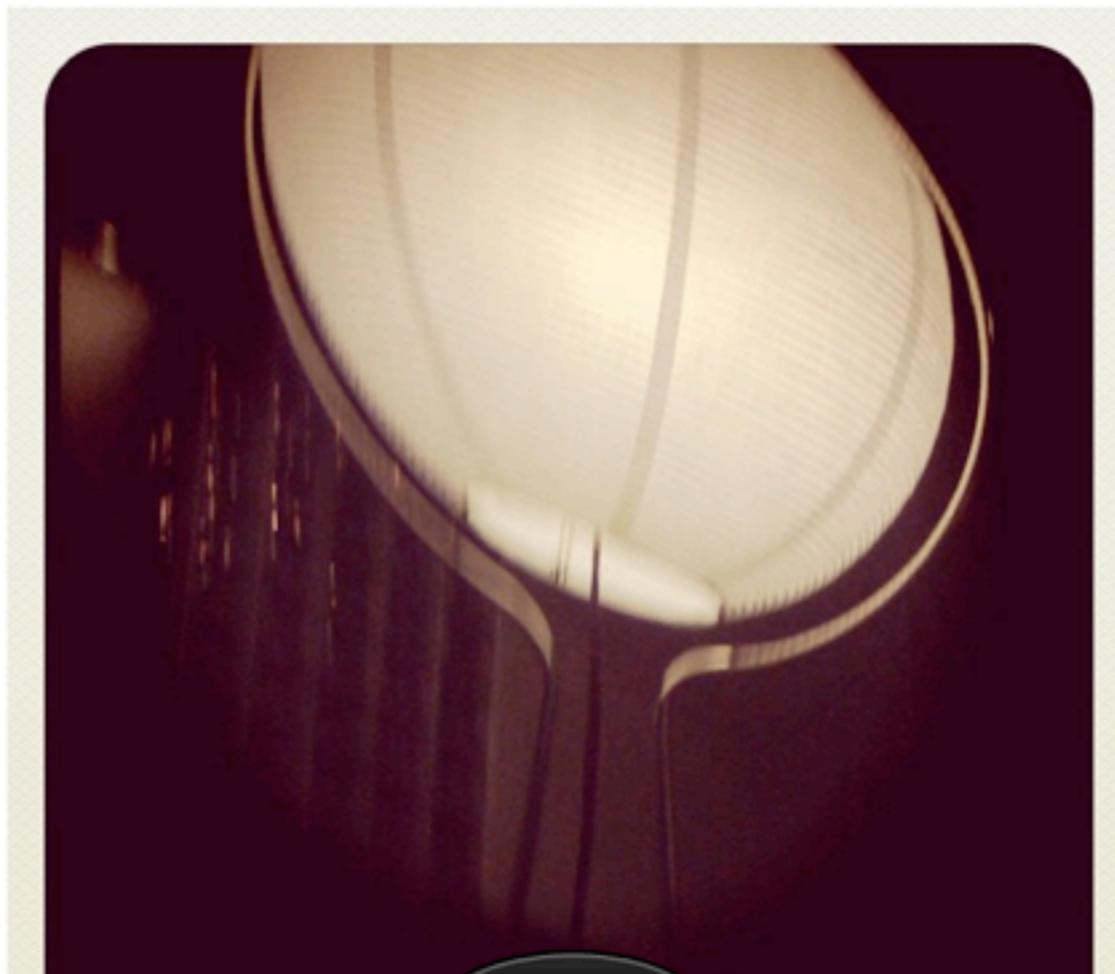
• 3h

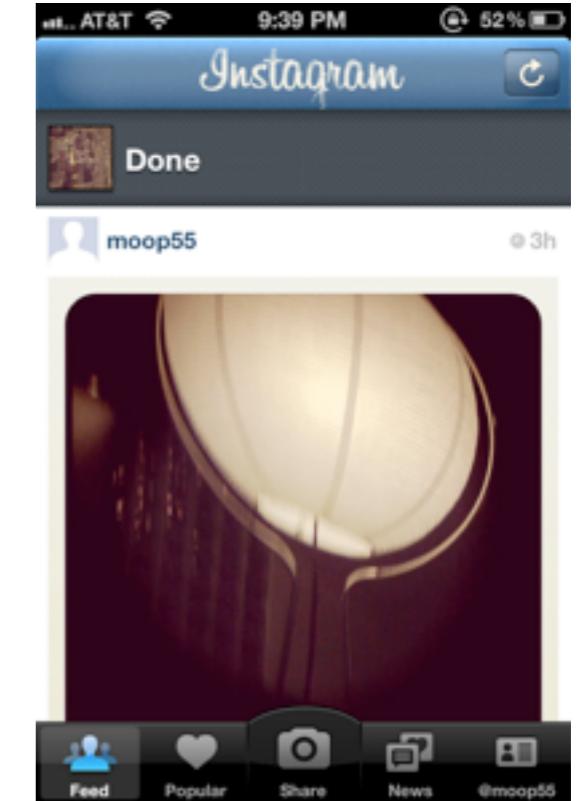
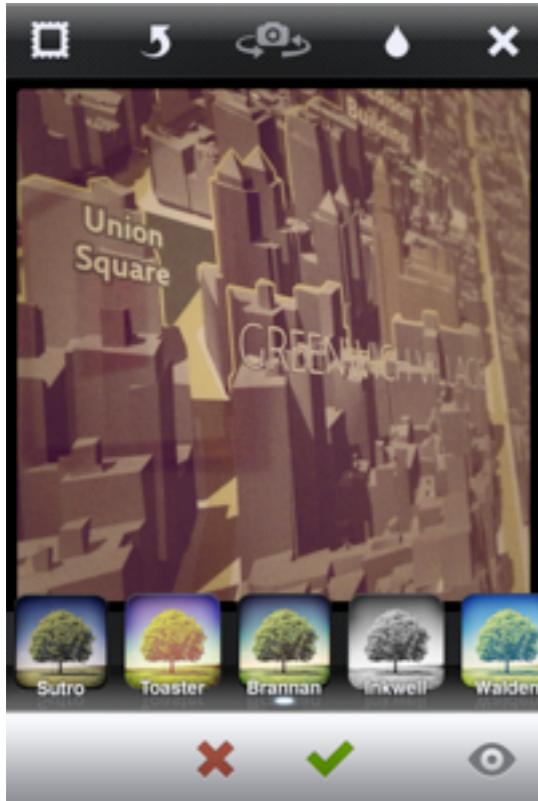




moop55

3h





we start uploading here

most apps upload here

non-optimal engineering
solution

2 requests, 2 round-trips

+ latency

need to match up

but makes uploads feel
really, really quick

send data/info as soon
as part of it's ready to go;
match up later

worth it even if you throw
out the data on cancel

why it works

where to go from here

“it works” isn’t enough

design & development
collaboration



1. perform actions optimistically
2. adaptively pre-load content
3. move bits when no-one's watching

QS?

we're hiring: jobs@instagram.com
get in touch: [@mikeyk](https://www.instagram.com/@mikeyk)