White Hat Hacking
For Fun and Profit

Tamara “Tammy” Denning
Tadayoshi “Yoshi” Kohno
Adam “Adam” Shostack

University of Washington
WHO WE ARE

Tammy

Yoshi

Adam

• Tammy + Yoshi: University of Washington, Computer Science and Engineering, Security and Privacy Research Lab
• Adam: Honorary member of the UW Security Lab
The Rest of the Lab

Tammy

Yoshi

Adam

Franzi

Karl

Tope

Alexei

Miro
The Rest of the Lab

Roxana  Gabe  Iva  Cynthia  Dan

Franzi  Karl  Tope  Alexei  Miro
The Rest of the Lab

Roxana  Gabe  Iva  Cynthia  Dan

Mike  Anya  Deborah  Mei  Sidhant
A Typical Day in the Lab

MISSION

Crash Test Dummy
The wheel sensor's connected to the…engine computer; the engine computer's connected to the…brake computer. The modern automobile is completely drive-by-wire.

CRYPTANALYSIS
You can plug into the car's internal computer network, but you need to bypass the authentication scheme before you can get anywhere.

HARDWARE Hacking +1
Hack the engine.

HARDWARE Hacking -1
…and the brakes.

CONNECTIONS
Get access to a race track for some road testing.

Success: Hacker Cred. Next round, draw an extra Mission card; you may take both to the Staff Video Conference before you decide which to play (and discard the other).

Failure: Hacker Cred
A Typical Day in the Lab

MISSION

Here’s Looking at You, Kid
A webcam-equipped Wi-Fi robot in the kids’ aisle?
“Imagine, being able to control your toy robot from
a friend’s house. You’re a super spy!” Time for a pro
bono security audit.

🌟 NETWORK NINJA
I find your lack of encryption disturbing.

🌡 FORENSICS -1
Modify their logging procedures so that they record
enough information to detect anomalous logins.

Success: No encryption means that
anyone can intercept and watch the toy’s
video stream. Notify the vendor.

+1 Hacker Cred

Failure: -1 Hacker Cred

CONTROL-ALT-HACK™
A Typical Day in the Lab

MISSION

Tech or Treat?
Halloween is fast approaching, and your haunted houses are the stuff of legends.

🌟 SOFTWARE WIZARDRY
Robotic bat, check. LED-o’-lantern, check. Eerie soundtrack, check. Now choreograph the action with custom software.

Cryptanalysis
Will anyone notice the secret message blinking from your pumpkin?

 kısm SOCIAL ENGINEERING
After all the high-tech tricks, no one was expecting that you’d be hiding inside the “stuffed” scarecrow.

Success: 🧟 Hacker Cred and draw an Entropy Card.
Failure: 💀 Hacker Cred
A Typical Day in the Lab

**Oscilloscope**
Buy your own oscilloscope so you're not borrowing the one from work. It's much easier for observing the electrical signals than to reinvent the wheel. Cost: $3K

**Software Library**
Sometimes it's easier to stand on the shoulders of giants than to reinvent the wheel. License for some useful software. Cost: $3K

**Visualization**
It can be overwhelming to sift through those network logs by hand. Use a tool to communicate pattern and graphed out. Goo...pfft. Cost: $2K

**Espresso Machine**
Some would call it a long night. But with your new espresso machine, you don't need any sleep—and have extra time to look at those log files! Cost: $2K

*Bag of Tricks*
Wait, what?
Yes, it’s a card game

<table>
<thead>
<tr>
<th>Control-Alt-Hack(TM): White Hat Hacking for Fun and Profit (A Computer Security Card Game)</th>
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**Turbo Talks**

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<th>Name</th>
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<tr>
<td>Ryan Barnett</td>
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<tr>
<td>Sean Bainum</td>
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<td>Jonathan Claudius</td>
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**Presented By:**

Tadayoshi Kohno
Tamara Denning
Adam Shostack
Motivation
• Security issues litter the news

• Same old story:
  • People designing product X didn’t think about security
  • People deploying product X didn’t think about security
  • People using product X didn’t think about security
• What’s worse:
  • Sometimes companies have security teams that advocate for security, but *product teams can’t justify the expense*
  • Sometimes people on the product teams want security, but their *managers can’t justify the expense*

• Part of the problem: *awareness and priorities*
Our Key Questions

• How can we get product teams to think about security during development and reach out to security teams?
• How can we get managers to invest in security?
• How can we train the next-generation computer scientists in security?

• Side question: How can we help the general public understand and prioritize security?
• Get ’em while they’re young!
• Emphasis on:
  • Highschoolers
  • Undergraduates
  • Young developers
• STEM demographic
  • (Science, Technology, Engineering, Math)
Orientation
Why a Game

- The Security toolbox is too full of sticks

- Let’s add carrots
  - Games, humor, etc.
  - Entice people towards security
  - Control-Alt-Hack™ is our most recent effort in this direction
  - There’s a wide open field!
Why a Physical Game

• Physical artifact
  • Adam: Elevation of Privilege card deck
  • Tammy + Yoshi: Discovering Security Threats card deck
  • Core Security’s Exploit!

• Co-location, discussion, collaboration
  • Coffee time, lunch, TGIF

• Social “permission” to explore, admit ignorance

• Humor creates relaxed, open atmosphere
Different Types of Games

- Different games form a spectrum of:
  - Time to learn, time to play
  - Equipment: cards, boards, dice, etc.

- Craps, War, Blackjack
- Backgammon, Chess, Go
- Trivial Pursuit, Cranium, Apples to Apples
- Settlers of Catan
- Dungeons and Dragons
• We are not game designers
• We scoured game stores for game mechanics

• *Ninja Burger* from Steve Jackson Games!
Serendipity!
• We licensed the Ninja Burger mechanics, but re-did the content for our purposes
• Steve Jackson has provided incredibly valuable advice and feedback
• (Though any problems are purely our own)
You and your fellow players work for Hackers, Inc.: a small, elite computer security company of ethical (a.k.a., white hat) hackers who perform security audits and provide consultation services. Their motto? “You Pay Us to Hack You.”

Your job is centered around Missions—tasks that require you to apply your hacker skills (and a bit of luck) in order to succeed. Use your Social Engineering and Network Ninja skills to break the Pacific Northwest’s power grid, or apply a bit of Hardware Hacking and Software Wizardry to convert your robotic vacuum cleaner into an interactive pet toy... no two jobs are the same. So pick up the dice, and get hacking!

**GAME INCLUDES**
- 1 RULEBOOK
- 3 DICE
- 156 GAME CARDS
  - 16 Hacker Cards
  - 56 Mission Cards
  - 72 Entropy Cards
  - 12 Attendance Cards
- 58 HACKER CRED TOKENS
- 42 MONEY TOKENS

**AGES** 14 & UP  
**PLAYERS** 3 – 6  
**GAME TIME** APPROXIMATELY 1 HOUR  

www.ControlAltHack.com
The Hacker Card

FRANZI

12 HARDWARE HACKING
9 CRYPTANALYSIS
12 NETWORK NINJA
12 CONNECTIONS
8 SOCIAL ENGINEERING
8 BARISTA

* SOFTWARE WIZARDRY
10 KITCHEN SINK

She never fails a Software Wizardry roll, no matter what.

When not working as the company’s resident software wizard, Franzi spends her time traveling to new places and meeting new people. Her current record is 13 countries in one year.
# Hacker Skills

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<td></td>
<td>🔍 Search Fu</td>
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<tr>
<td></td>
<td>🍺 Kitchen Sink (catchall)</td>
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</table>
The Mission Cards

**FRANZI**

- 12 HARDWARE HACKING
- 12 NETWORK NINJA
- 8 SOCIAL ENGINEERING
- * SOFTWARE WIZARDRY

She never fails a Software Wizardry roll, no matter what.

When not working as the company’s resident software wizard, Franzi spends her time traveling to new places and meeting new people. Her current record is 13 countries in one year.

**MISSION**

**Lights, Camera, Hack!**
You’ve been hired to consult on a new cyberthriller movie.

- **CRYPTANALYSIS**
  Look through the script for blatant inaccuracies.

- **SOCIAL ENGINEERING +3**
  Can you convince the producers that hacking doesn’t actually look like a speed-typing race?

**Success:** You’re don’t know that many hackers that code in leather bodysuits or designer sunglasses, but no one in your office is complaining. +1 Hacker Cred

**Failure:** You’ve already told everyone about consulting on the movie, so its inaccuracies are triply embarrassing. -3 Hacker Cred
**The Entropy Cards**

**Entropy**

**Bag of Tricks**

**Lightning Strikes**

You are the target of a social engineering attack. This card cannot be played on a player with a Newb Job.

**Awareness Training**

Two weeks ago the target held training seminars about social engineering threats. Great that everyone is on the alert, but it does make your job harder.

+2 Social Engineering

*Keep this card after use.*

You are at a -3 penalty to your Social Engineering skill on your next roll (but not subsequent re-rolls).

*Discard this card after use.*
How to Play
Alice, Bob, and Carol are playing.
Everyone gets: 3 Entropy Cards, 1 Hacker Card, 1 Not Attending Card, and 6 Key Cards.
Ready to start playing...
Round 1

Phase 1: Distribute Money and Draw Entropy Cards.

Alice

Bob

Carol

w00t.
Phase 2: Draw Mission Cards.
If you choose to attend the Staff Video Conference, play this card face down during Phase 2.

If you attend the Staff Video Conference, you:

> draw an additional Entropy card.
> may trade or bargain with other players to exchange Missions.
> may be stuck with a Newb Job, if you have a low Hacker Cred score (see rules).
> may push your Newb Job onto a player with a low Hacker Cred score (see rules).

If you are the only player who attends the Staff Video Conference, you also get one free re-roll during your Mission.

If you choose to NOT attend the Staff Video Conference (and instead have "connectivity issues"), play this card face down during Phase 2.

If you do not attend the Staff Video Conference, you get one free re-roll during your Mission.
Phase 3: Stalling Time Conference.

Alice: Trade Me!
Bob: No.
Carol: No.
Phase 4: The Missions (Player Turns).

Alice

Bob

Carol

rand()
Blind Trust
Sometimes you think people will install any phone app, no matter where it comes from. Time for an experiment.

Software Wizardry
Write a game that secretly takes a photo every 30 minutes. (As a white hat, you play nice, so don’t upload them!)

Social Engineering

Success: They may have trusted you, but your app isn’t so blind. Some of those photos could be really, um, interesting.

1 Hacker Cred

Failure: You released a Trojan app—what were you thinking? -1 Hacker Cred
LIGHTNING STRIKES

Play this card on a rival starting a Mission, before any die rolls are made. This card cannot be played on a player with a Newb Job.

**Got a Date**

You met someone charming! Get a last-minute reservation for tonight's date at that amazing Thai place.

Roll vs. 🐱 Social Engineering.

**Success:** Continue with your Mission.

**Failure:** -1 Hacker Cred immediately. Continue with your Mission.

*Discard this card after use.*
rand()

“…”

Alice

$2K

Hacker Cred

Got a Date

You met someone charming! Get a last-minute reservation for tonight’s date at that amazing Thai place.

Roll vs. Social Engineering.

Success: Continue with your Mission.

Failure: 1 Hacker Cred immediately. Continue with your Mission.

Discard this card after use.
Phase 4: The Missions (Player Turns).

Alice: :P

Bob: :

Carol: :(
Alice

**Blind Trust**

Sometimes you think people will install any phone app, no matter where it comes from.

Time for an experiment.

**SOFTWARE WIZARDRY**

Write a game that secretly takes a photo every 30 minutes. (As a white hat, you play nice, so don’t upload them!)

**SOCIAL ENGINEERING**


**Success:** They may have trusted you, but your app isn’t so blind. Some of those photos could be really, um, interesting.

**Hacker Cred**

**Failure:** You released a Trojan app—what were you thinking? **Hacker Cred**

Once per turn, she may substitute any one skill for any other skill. This substitution only applies to one task.

As a connoisseur of relaxation (there’s nothing better than a lazy nap on a Saturday afternoon!), Deb knows better than to face a challenge head-on when there’s a workaround.

Bob

Carol

rand()
Blind Trust
Sometimes you think people will install any phone app, no matter where it comes from. Time for an experiment.

**SOFTWARE WIZARDRY**
Write a game that secretly takes a photo every 30 minutes. (As a white hat, you play nice, so don’t upload them.)

**SOCIAL ENGINEERING**

**Success:** They may have trusted you, but your app isn’t so blind. Some of those photos could be really, um, interesting.

**Failure:** You released a Trojan app—what were you thinking? 1 Hacker Cred

Once per turn, she may substitute any one skill for any other skill. This substitution only applies to one task.

As a connoisseur of relaxation (there’s nothing better than a lazy nap on a Saturday afternoon!), Deb knows better than to face a challenge head-on when there’s a workaround.
Phase 4: The Missions (Player Turns).
Phase 4: The Missions (Player Turns).

Alice

Bob

Carol

$2K

$2K

$2K

$1K

rand()
If you choose to NOT attend the Staff Video Conference (and instead have “connectivity issues”), play this card face down during Phase 2.

If you do not attend the Staff Video Conference, you get one free re-roll during your Mission.
Magical Lessons

Sleight of hand, distractions, bluffs, fakes—magic has a lot to teach about using misdirection to con people.

Once per turn, you may re-roll a failed Social Engineering roll.

*Keep this card in play.*

Cost: $2K
Phase 4: The Missions (Player Turns).

- **Alice**: $2K, 5 Hacker Cred, 1 Hacker Cred
- **Bob**: $2K, 5 Hacker Cred
- **Carol**: $2K, $1K, 5 Hacker Cred

The image shows a dice roll with the number 13.
Phase 4: The Missions (Player Turns).
Phase 5: Hacker Cred Bonus/Penalty
Phase 6: Discard Entropy Cards
Phase 7: Check Hacker Cred

Alice  $2K
Bob  $2K
Carol  $1K
And that’s a round!
(...you get the hang of it as you play)
INTEGRATING LEARNING OBJECTIVES
“Public Relations”

• Computer science can be fun!
• Computer security can be fun!
• Stereotypes are inhibitory – computer science and computer security can be for anyone

• Help broaden the public’s understanding of the word “hacker”
**Key Learning Objectives**

- Computer security != laptops, desktops, and the Web
- Diversity of attack techniques and attacker goals

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<th>Example Technologies</th>
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<tr>
<td>Sniffing unencrypted data streams</td>
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<td>Tracking / Tracking circumvention</td>
</tr>
<tr>
<td>Special equipment</td>
<td></td>
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</table>
SOCIAL ENGINEERING

MISSION

I Hack You a Latte
You’re switching it up for this company audit. Tell the front desk that you’re opening a new café and want to set up a promotional coffee cart in their lobby.

connections or ☕️ WEB PROCUREMENT
Of course, you need actual coffee cart equipment to pull this off.

☕️ BARISTA
12oz, non-fat, split-shot, extra-hot, 3-pump mocha with whip. Can you keep all the orders straight?

⭐ NETWORK NINJA
Plug into their internal wired network when nobody’s looking and pwn them.

Success: +1 Hacker Cred. Choose one Bag of Tricks card from your hand or the discards; you can play the item free of charge.

Failure: -1 Hacker Cred
**Mission**

**Shock Value**
Is the Pacific Northwest's power grid secure?

**Social Engineering - 2**
Call the IT desk ("I'm a new employee!") and con them into giving you the IP (Internet) address of one of their servers.

**Network Ninja**
Their computers can't be taken down for the standard software update procedures—and that means that you can exploit code that everyone else patched in 1999.

**Success:** +2 Hacker Cred. The managers are shocked; you aren't.

**Failure:** -1 Hacker Cred
**Unusual Attacks**

**Bag of Tricks**

**Dumpster Diving**

You don’t mind getting dirty. You’re happy to dig through a company’s garbage to look for un-shredded specs, documentation, and inter-office memos. This time the client’s guards are vigilant. Rent a garbage truck, then go through your haul off-site.

Play this card during a Mission. All your Hardware Hacking rolls for the Mission are automatic successes.

*Discard this card after use.*

**Cost:** $4K
Humor!

MISSION: NEWB JOB

Love Is in the Air
You’re demonstrating Wi-Fi security risks to an auditorium of 500 students as part of Online Security Awareness Week.

NETWORK NINJA -3
Download free software that intercepts Wi-Fi traffic, then displays the images that nearby computers are browsing. Live demos are jinxed, so triple check everything.

Success: The students got the point. But next time, verify that all students are 18+ before the demo. 1 Hacker Cred
Failure: 1 Hacker Cred

I’d Tap That

Going All the Way

That’s What She Said
You don’t always want to share your conversations with the world; experiment with a new security scheme for cellular phone calls.

SUCCESS

WEB PROCUREMENT
Get a bunch of cheap handsets for your experiments.

HARDWARE HACKING OR CONNECTIONS
Cobble together some hardware to act as a cell phone base station or borrow the real thing from a friend.

CRYPT ANALYSIS
Design and implement your new encryption scheme.

Success: 1 Hacker Cred. Your new cellular protocol is great—now there’s one more secure option that companies can decide not to use.
Failure: 1 Hacker Cred. Discard one Bag of Tricks card that you have in play.
REFERENCES!
MISSION: NEWB JOB

9 6 31 25 26 27 28 6 1 7 13

Your nephew needs help with his math homework. Help him solve these cryptograms.

CRYPTANALYSIS
2 14 12 12 27, 23 27 6 12 16 — 16 15 16
31 27 21 14 18 25 14 26 3 14 27 7 14 26 2
15 20 28 14 12 13 14?

CRYPTANALYSIS -1
23 2 2 26 27 13 31 27 21 6 9 6 31 25 26 27
30 21 ? 16 15 16 31 27 21 20 27 26 15 9 14
26 2 2 26 26 2 15 13 23 1 13 14 20 9 6 31
25 26 14 16 23 15 26 2 6 13 1?

NOTE: Solving these cryptograms is optional. Groovy, but optional.

Success: No reward. You were expected to succeed.

Failure: -1 Hacker Cred.
Development Process
Development Overview

Set Goals

Review Budget and Timeline

Develop (Mechanics and Graphics)

Arrange Production

(Play)Test

...oops, too late now
DEVELOPMENT OVERVIEW

1. Set Goals
2. Review Budget and Timeline
3. Arrange Production
4. (Play)Test
5. Develop UI, Graphics and Audio
Card Topics

- attack techniques or characteristics
  - special equipment
  - man-hours
  - distracted
  - entering building when there's a large conference going on
  - false positives with alarm systems
- technical skills
- physical skills
- social skills
- inside information, design, and specifications
- inside information, implementation
- inside information, usage or anonymity
- web tracking, advertisement
  - history stealing
- legislative changes
- online predators
- standards changes
- latent threat
- diverse geographic jurisdiction
- 3D printing
- destroy forensic logs
- buffer overflows
- DDOS
- DNS
- SSL cert problem
- reverse engineering
- using the reflections on tape
- Extortion
- Firesheep (kind of -- we have the resale of ill gotten goods
- human CAPTCHA-solving skills
- Don't lose sensitive information

Target Technologies
- high-tech soda machine
- antivirus definitions
- medical devices
- elevators
- airport
- synthetic biology
- bank
- voting
- targeted malware
- bad random number generators
- some missions involve non-technical things, like appeal of computer science
- do something with etextiles
- power grid
- train systems
- traffic lights
- coffee shop sniping injection
- RFIDID systems
- casinos/gambling machines
- Augmented reality
- Personal Sensors
- 3D printing (although there is a 3D printing-related article)
- water
- food (shipping)

Other category
- CISSP certification -- costs money.
- Maybe need to get trained in ethics?
- Does this fit here or with interesting times? You find a vulnerability and go straight to the media without thinking through the consequences. In this case, you should have told the manufacturers first. Lose reputation / get reprimanded
- Another thing to do with money (if fail a mission). Donate to the EFF, donate to UWC, donate to Tor

Customers
- charity
- friend or family
- government
- company
- university

Attackers
- hobbyist
- employee
- honest but curious
- neighbor
- script kiddy
- government
- organized crime
- group (as a anonymous)

Salaries
- $
Ninja Burger Skills

- Combat
- Stealth
- Disguise
- Climbing
- Customer Service
- Driving
- Math
- Ninja Lore
- Computers
- Animals
- Swimming

Control-Alt-Hack Skills

- Hardware Hacking
- Network Ninja
- Social Engineering
- Software Wizardry
- Cryptanalysis
- Lockpicking
- Forensics
- Search Fu
- Barista
- Connections
- Web Procurement
Jim Bob’s Trailer

Ah’ve got a hankerin’ for thet Ninja Burger goodness...

(1) Combat at -1: Meet Jim Bob’s neighbors.
(2) Animals: Meet Jim Bob’s pit bull.
(3) Combat at +1: Meet Jim Bob’s kids.

Success: Gain 1 Honor and the Branch Manager’s respect. Next round, draw two Mission cards; you may take both to the Staff Meeting before you decide which to play.
Failure: Lose 1 Honor.
Ninja Burger Skills

- Combat
- Stealth
- Disguise
- Climbing
- Customer Service
- Driving
- Math
- Ninja Lore
- Computers
- Animals
- Swimming

Control-Alt-Hack Skills

- Hardware Hacking
- Network Ninja
- Social Engineering
- Software Wizardry
- Cryptanalysis
- Lockpicking
- Forensics
- Search Fu
- Barista
- Connections
- Web Procurement
(47) Something about a startup

What's the startup about? It could be a generic social networking
blah blah, but how about maybe powerline emission security?

Connections. Use your connections to get funding.
Hardware Hacking at +1.
Hardware Hacking at -1.
Cryptanalysis. Devise a scheme to add white noise/filter...

Success: +1 Reputation. Next round, draw two Mission cards; you
may take both to the Staff Video Conference before you decide which
to play.
Failure: -1 Reputation.
(47) Crash Test Dummy

The wheel sensor’s connected to the ... engine computer; the engine computer’s connected to the ... brake computer. The modern automobile is completely drive-by-wire.

Cryptanalysis. You can plug into the car’s internal computer network, but you need to bypass the authentication scheme before you can get anywhere.

**Hardware Hacking at +1.** Hack the engine.
**Hardware Hacking at -1.** ...and the brakes.
**Connections.** Get access to a race track for some road testing.

**Success:** +1 Reputation. Lights, speedometer, transmission, airbags – is there anything on the car that you can’t control?
**Failure:** -1 Reputation
Crash Test Dummy

The wheel sensor's connected to the...engine computer; the engine computer's connected to the...brake computer. The modern automobile is completely drive-by-wire.

CRYPTANALYSIS
You can plug into the car's internal computer network, but you need to bypass the authentication scheme before you can get anywhere.

HARDWARE HACKING +1
Hack the engine.

HARDWARE HACKING -1
...and the brakes.

CONNECTIONS
Get access to a race track for some road testing.

Success: +1 Hacker Cred. Next round, draw an extra Mission card; you may take both to the Staff Video Conference before you decide which to play (and discard the other).

Failure: -1 Hacker Cred
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<th>Disguise</th>
<th>Climbing</th>
<th>Customer Service</th>
<th>Dining</th>
<th>Math</th>
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<th>Type of Technology</th>
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**Note:** The table contains various mission cards with their corresponding attributes and security goals. Each card has a type of technology and adversary motivations linked to it. The security goals column includes various aspects like confidentiality, integrity, and availability.
Development Overview

1. Set Goals
2. Develop (Mechanics and Graphics)
3. Review Budget and Timeline
4. Arrange Production
5. (Play)Test

The process is cyclical, with each step informing the next.
• Instruction refinements...clarifications...

• Attendance cards!
Development Overview

1. Set Goals
2. Develop (Mechanics and Graphics)
3. Review Budget and Timeline
4. Arrange Production
5. (Play)Test
STILL NOT PERFECT

**MISSION**

**Lights, Camera, Hack!**
You've been hired to consult on a new cyberthriller movie.

**CRYPTANALYSIS**
Look through the script for blatant inaccuracies.

**SOCIAL ENGINEERING +3**
Can you convince the producers that hacking doesn’t actually look like a speed-typing race?

**Success:** You don’t know that many hackers that code in leather bodysuits or designer sunglasses, but no one in your office is complaining. **+1 Hacker Cred**

**Failure:** You’ve already told everyone about consulting on the movie, so its inaccuracies are triply embarrassing. **-3 Hacker Cred**

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82
The Big Picture
• We made a card game!
• The game is designed to be fun
  • An essential property!
• While also
  • Raising awareness
  • Educating
  • Promoting communication
• Fun game with educational content – not educational game
• Toward meeting these goals
  • Highly iterative content creation
  • Professional design, professional manufacturing
  • Copies to give away
  • Copies to sell
• Website:  http://www.ControlAltHack.com

• Twitter:  @ControlAltHack
  #ControlAltHack

• List:  control-alt-hack@cs.washington.edu
  (announcements only)
• At the printer now!

• Available for sale soon
  • Selling so that it’s self-sustaining and broadly available
  • Planning to use a large, Seattle-based online retailer
  • Go to http://www.ControlAltHack.com to sign up for announcement emails, or follow @ControlAltHack for announcements
  • Being sold by RGB Hats, LLC
Free Copies

- For U.S.A.-based educators
  - We have a limited number of copies that we can give to educators for educational uses (we’ll filter)
  - Visit [http://www.ControlAltHack.com](http://www.ControlAltHack.com) to apply

- Educators?
  - High school AP computer science classes
  - Freshman, sophomore computer science classes
  - College computer science clubs
  - Other?

- (High school teachers may wish to remove a few cards from the deck)
Future Game Content

• Current deck (based on the original *Ninja Burger*)
  • 56 Missions
  • 72 Entropy Cards

• Possible expansion deck (based on the *Ninja Burger* expansion deck)
  • 72 new cards

THANKS TO!

intel

SIG CSE
CALL TO ACTION
• Go get the game
• Go play the game
• Share the game with others
• Tell us how it goes

• Go make your own games
• Go add carrots to your toolbox