

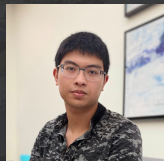
Original Problem:

Ground security personnel need an **automated way to detect unique individuals** in large crowds

> **108** >
interviews

Updated Problem:

Security personnel **at embassies** need an automated way to **identify recurring figures and threats earlier** and **process them faster** to facilitate response.



Mac
BS/MS



Faraz
MBA

Problem Sponsor: Mark Breier (In-Q-Tel)

Mentors: Brian Miller (BMNT)

Col. Russ Corwin (US Army)

Our journey took place in three phases

1

**Problem
discovery**

*We realize just how
much we don't know*

2

**Solution
building**

*We scope out a
prototype and start
getting people
excited*

3

**Where we go
from here**

*We figure out how
to build a product*



1

Problem discovery

2

Solution building

3

Where we go from here

Automated detection is a multi-sector problem

Sample industries we spoke to



Senior officials agree that embassy security has its weaknesses

Guards outside "are **not exactly the Wagner Group** [elite Russian paramilitary]"

- US Ambassador (ret.)

"Malicious actors often **case and surveil** the facility long **before the attack occurs**"

- Member of US IC

"There is an **uncomfortable complacency...** once they believe that they're secure"

- Army Cyber Officer

Next step: We need access to **folks on the ground** to really understand the problem

Recorded footage shown to us at Sheraton Security HQ

We went to visit
a security
center where
they showed us
sample footage

Did you notice it
was Mac? Neither
did we, at first



We visited a security HQ and saw firsthand just how difficult it is to be a security guard

Our photos from our visit to a hotel's security HQ



40+ security feeds across 6 monitors



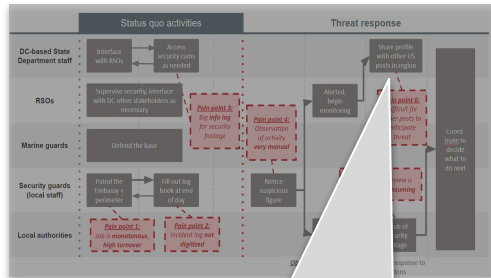
Limited visibility with inclement weather



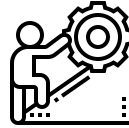
BOLOs - Banned individuals to be on the lookout for

We distilled what we heard from all parts of the security org into a few key pain points

*Illustrative:
our validated process flow*



“You guys are actually **surprisingly accurate**” - Member of US IC



For guards:

- Time consuming
- Highly manual
- Subject to error

Need ways to be more **efficient and effective**



For policy makers:

- Missed warning signs
- Information lag

Need to better **understand the threat landscape** against US



1

Problem discovery

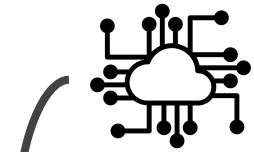
2

Solution building

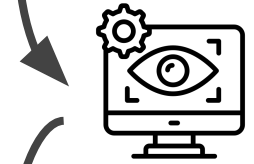
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Where we go from here

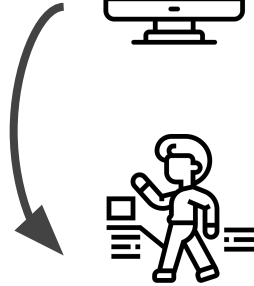
We focused on gait analysis first



Emerging tech



Computer vision



Gait analysis



“Gait analysis will be an
**exponential game
changer**”

- Individual from 3-Letter Agency

Critical guidance in Week 5:

“Focus on building the **best product** at scale **not the best algorithms**”

– IQT Leader

Based on that feedback, we mocked up a proposed product



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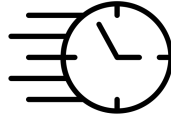


Our vision for the future of physical security



Comprehensive Re-Identification:

Anyone
Anywhere
Anytime



Next-Gen Forensics:

Instantly **search
videos**, in minutes



Multi Modal suite:

Combine data
across domain for
**maximum
accuracy**



Insights to Action:

Anticipate security
threats and enable
real-time
response



1

Problem discovery

2

Solution building

3

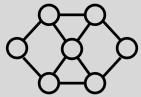
Where we go from here

We understand the problem and a path to the solution

| | | | | |
|--|---|---|--|---|
| <p>KEY PARTNERS</p> <ul style="list-style-type: none"> • Data providers with high-quality train/test sets (S) • Hardware (CCTV) providers (S) – off the shelf and commercial grade • Cloud data providers (S) • Continued mentorship from In-Q-Tel (P) • DoD IT Accreditation Agencies (P) • DoS/govt. facilities (Cu) – custom solutions for automated security • Private security providers (Cu) • Prime Defense Contractor | <p>KEY ACTIVITIES</p> <ul style="list-style-type: none"> • Machine learning (data, pipelining, model training, evaluation, ablation, tuning) • UI/UX Design (data presentation, historical performance, dashboards) • Security Accreditation • Customer/Vender Data Privacy Analysis | <p>VALUE PROPOSITIONS</p> <ul style="list-style-type: none"> • Improve security around high-risk locations: be able to identify, track, and re-identify suspicious actors • Better characterize activity and behavior in physical areas: better classification of both activities and concrete actions of individuals around a physical location • Enhanced tracking technology: widely applicable tracking techniques apply to a number of different domains | <p>BUY-IN & SUPPORT</p> <ul style="list-style-type: none"> • Need demand from government agencies around physical facilities. • Need pilot implementation for one government/commercial facility • Would need access to secure systems for initial program | <p>BENEFICIARIES</p> <ul style="list-style-type: none"> • Primary: high-risk government facilities + ground personnel (embassies, national borders, forwarding operating bases, national borders, police). • Secondary: high-risk public + commercial locations (banks, mall security, private security, school campuses, large events, hotels, local police manufacturing facilities). • Tertiary: businesses characterizing foot traffic, home security (small businesses, homeowners). • Quaternary: machine learning researchers + applicants. |
| <p>MISSION BUDGET/COST</p> <ul style="list-style-type: none"> • Dataset provision (data gathering, labeling, acquisition) • ML model training costs (cloud development costs) • Software development costs (labor) | | <p>MISSION ACHIEVEMENT/IMPACT FACTORS</p> <ul style="list-style-type: none"> • Number of security incidents detected(KPI) • Number of security incidents with unidentified adversaries (KPI) • Response time for public safety and security incidents (KPI) • Improved security of public + private facilities (overarching) • Adoption across government + commercial facilities (overarching) • Effective characterization of nearby public traffic dynamics | | |

What's next? A daunting yet exciting future!

6 weeks post class



Refine and tune Re-ID algorithms.



Secure early funding.

12 weeks post class



Enhance product features: design, Interactive UI.



Find initial trial partner + refine GTM strat.

16 weeks post class



Begin addtl. prod. offerings: search + forensics.



Build key partnerships + proof of concept.

We have the right team to build this



Our ask for you

Government Officials

- SBIR support letters
- Grant opportunities

Private Sector

- Dataset creation + augmentation
- Initial trial advocates + partnership

Investors

- Funding + Accelerator/ Incubator programs
- Connection to portfolio companies

Find us at: <https://tinyurl.com/saiftech> or



Thank you to our incredible mentors, and to you!



SAIF



Appendix

Validating ideas |

People are getting excited about our project



Users expressed strong interest in our solution...

- *“Technology like this can **prevent** it [Benghazi] from ever **happening again**” – RSO in Rwanda*
- *“It takes **thousands of hours of manual work** to go through the footage for Manchester bombing” – British Intelligence*
- *“It’s very hard to gather and act on information from CCTV – NYPD”*

...while also pushing us towards further improvement

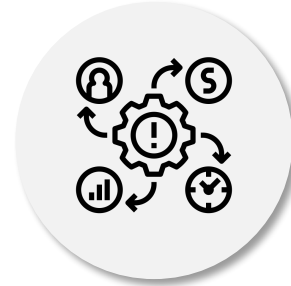
- *“**the more sensors** you can nest on top of each other, **the better** chance of having multiple hits” - Northrop Grumman*

Knowing that there's so much potential, we still have a lot of work ahead of us on both the tech and business sides



Technology

- Improve **model performance** and minimize Type 2 errors
- **Stress test** system performance on difficult scenarios (e.g. large crowds)
- **Test implementation** with initial partner(s)



Business

- Characterize the **tech landscape** for surveillance and security
- **Industry leaders** in computer vision on human movement (outside of security)
- **Expanded use cases** both USG and private sector

People got excited
about our ideas



We have a good understanding of embassy security pain points

- *“Repeat ID is a **very real problem**” - [redacted]*
- *“you were actually **surprisingly accurate**” - Three letter agencies*

Many users expressed interest in our solution...

- *“There were many **warning signs** in **Benghazi** months before it happen. **Technology** like this can **prevent** it from ever **happening again**” – RSO in Rwanda*
- *“It takes **thousands of hours** of **manual work** to go through the footage for Manchester bombing” – British Intelligence*

...while also pushing us towards further improvement

- *“**the more sensors** you can nest on top of each other, **the better** chance of having multiple hits” - Northrop Grumman*
- *“Focus on building the **best product** at scale **not the best algorithms**” – President of IQT*

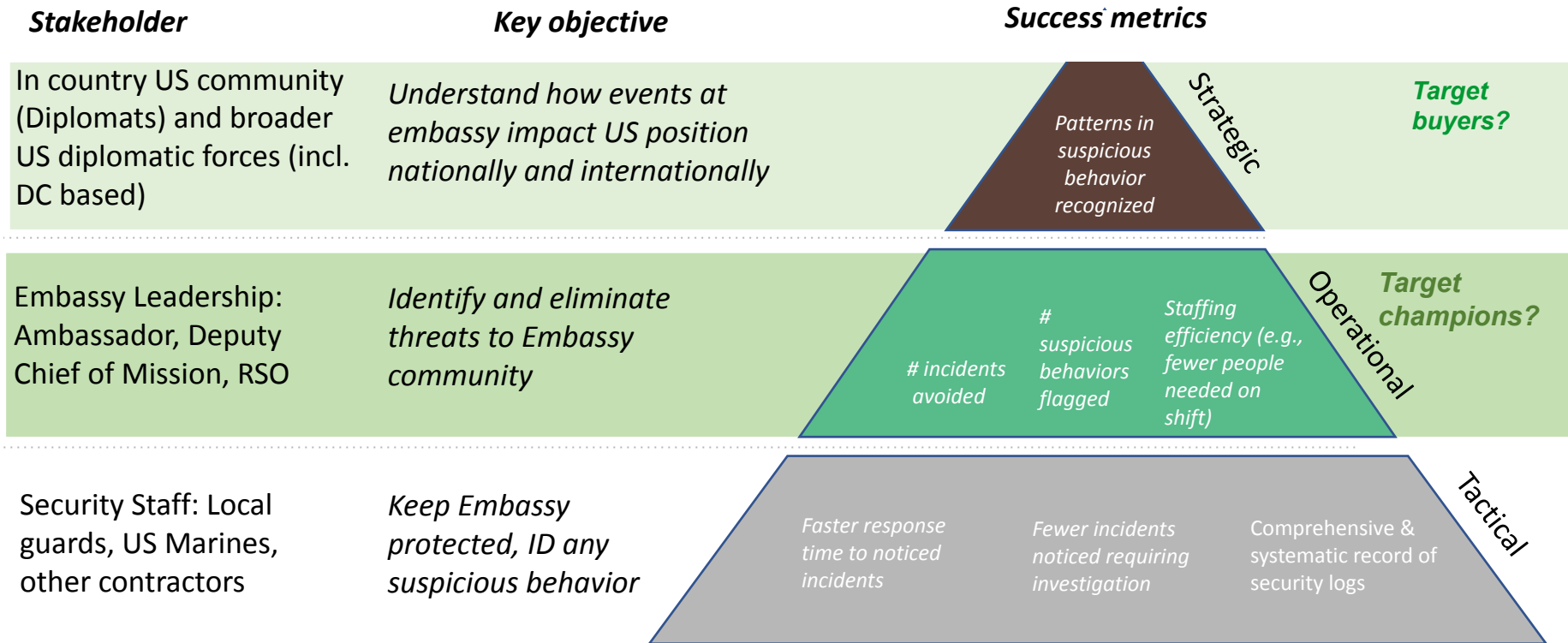
Key activities planned for coming months – timing HIGHLY tentative

| Category | June | Coming months □ |
|------------------------|---|--|
| Tech | Re-identification Models | End-to-End ML pipeline & Infrastructure |
| | Refining Design & UI | Initial integration on live camera systems |
| Business | Interactive Frontend demo | Search & Forensics capabilities |
| | Work closely with early adopters & Design partner | Multi-Modal integration |
| Funding & Partnerships | Identifying Dual-Use potential | Go-to-market strategy & Product differentiation |
| | Pre-seed funding & Grants | Building out Sales function |
| Deployment | Partner w/ cloud provider (AWS) & data labeller (i.e. Scale AI) | Academic Partnership (Stanford AI) |
| | MVP iteration and feedback from champion in IC | Product Demo and getting Buy-in from Senior executive |
| | SBIR & other gov. grants | Partner w/ camera provider |
| | | Collaboration w/ Prime defense contractors |
| | | Deployment of working prototype with IC or private partners (POC contract) |
| | | Funding Round (friends + fam) |
| | | Sign Proof of concept contract (POC) from customers |

Our planned activities and deliverables for the end of the quarter and this summer

| | End of the Quarter | | Summer |
|-----------------|---|---|--|
| <i>Tech</i> | <ul style="list-style-type: none">• One instance of E2E camera system• Updated user interface mock-up• Baseline infrastructure for live web app | ▶ | <ul style="list-style-type: none">• Iterate on fully connected, end-to-end web-app + ML MVP• Put product in hands of initial user for piloting and troubleshooting |
| <i>Business</i> | <ul style="list-style-type: none">• Competitive landscape of established + emerging tech companies• Defined requirements for:<ul style="list-style-type: none">→ SW integration with existing HW→ Scoped hardware requirements + feasibility | ▶ | <ul style="list-style-type: none">• Domain-specific breakdown of commercial + gov turnkey needs• Relationship building with gov nat. sec. organizations• Improved competitor analysis + hone differentiating value prop |
| <i>Funding</i> | <ul style="list-style-type: none">• Draft pitch materials• List of short-term grants + funding• Initial contact with VCs + angels | ▶ | <ul style="list-style-type: none">• Additional gov + private funding• Continued networking with VCs + angels |
| <i>Other</i> | <ul style="list-style-type: none">• Clear work plan and team roles for summer | | |

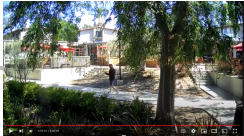
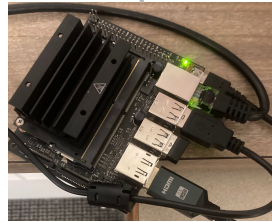
We believe there are 2 stakeholder groups that will be needed to get a purchased made



Implication: end users are not the champions
 → **even more critical that we understand the value prop for each group**

Technology | We're setting up a hardware MVP to collect the video data we need and have target milestones for SW dev.

Setting up hardware to being collecting data



Key activities in MVP development

- ✓ Update **model pipeline** with improved/additional models and infrastructure.
- ✓ Test **model** on real-world, in-the-wild collected data from campus videos.
- ✓ Improve user interface to meet ground user needs and augment experience.

Our ask for you



To take next steps, we need:

- \$320,000 in our pre-seed round
- Your contacts and connections
- Your contracts!

There are two key ways a new security tool could help an Embassy



**For guards:
Operational efficiency**

Create a tool easily identify incidents where they need to intervene



**For policy makers:
Strategic knowledge**

Better understand threat landscape for the US both in-country and globally



S Δ I F