DRONES FOR REMOTE COLLABORATION IN WILDERNESS SEARCH AND RESCUE

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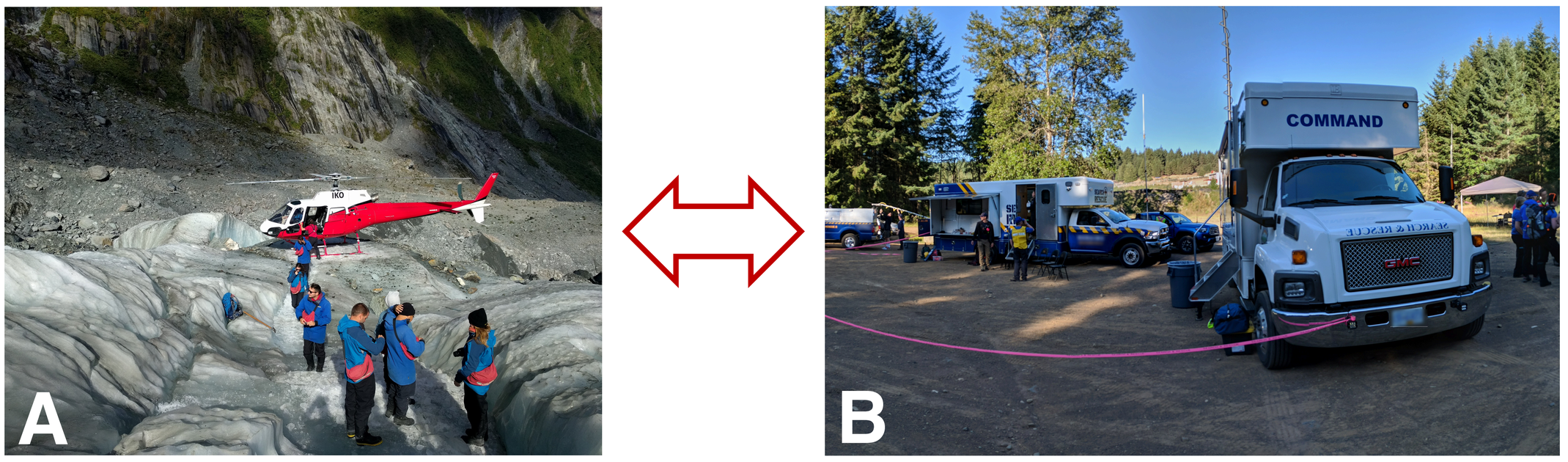
WILDERNESS SEARCH AND RESCUE

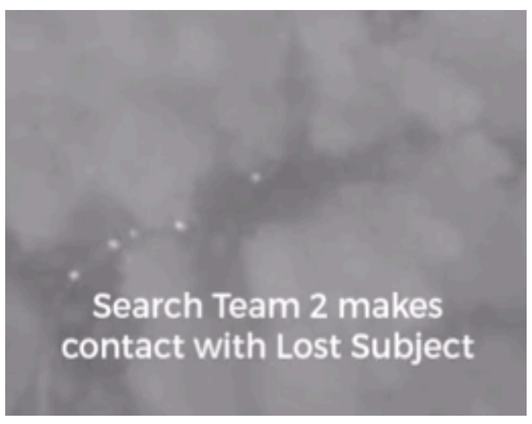
- In wilderness **search and rescue** (SAR), teams of **workers in the field (A)** search for one or more lost people in a wilderness area. They collaborate with **managers at a command post (B)**, who make planning decisions and oversee the operation.
- Wilderness SAR remote collaboration ***between workers in the field and at command*** could be potentially well-supported by drones.



DRONES FOR SEARCH AND INSPECTION

View of a drone helping a worker search through trees and shrubs.

- Drones provide a unique birds-eye perspective of the environment. However, we are not used to this perspective.
- **OPPORTUNITIES:** Can see things not visible from the ground, can go beyond basic "human-eye" vision (e.g., infrared images, high-fidelity video, etc.).
- **CHALLENGES:** Lots of information to process, difficult to match landmarks and directions between air and ground frames of reference, obstacle avoidance in dense areas.

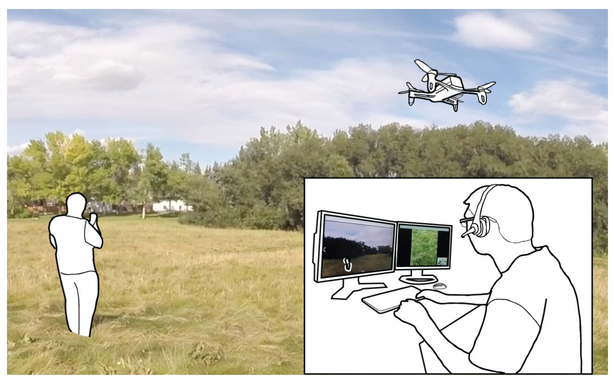


Heat cameras can help workers see people in tree-dense areas.

From Kamloops Search and Rescue, British Columbia, Canada

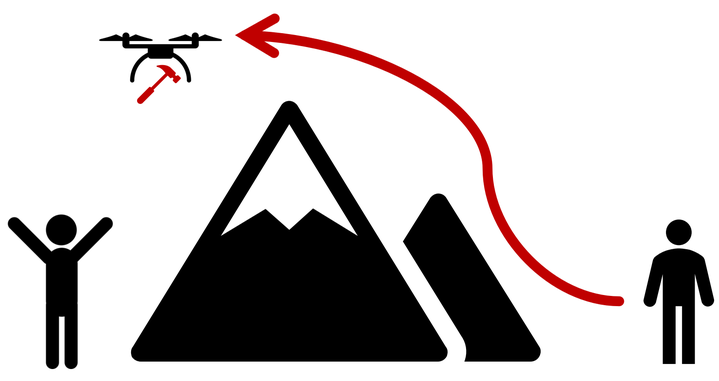
DRONES FOR REMOTE COLLABORATION

Drones can accompany a field worker as they **receive assistance** from a remote worker at command.

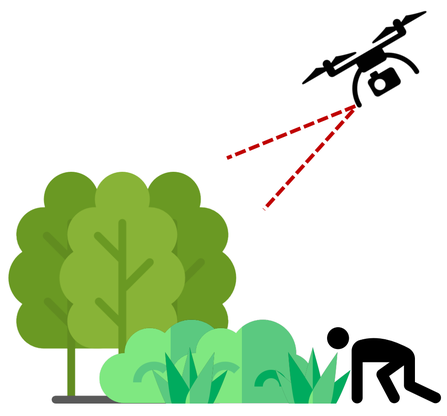


USE CASES:

(1) Guiding or Helping a Worker Navigate



(2) Physically Handling or Delivering Materials



(3) Searching Collaboratively from Higher Perspectives

DESIGN CONSIDERATIONS

(1) Reduce visual and auditory distractions while making the sight and sound of the drone useful to ground users.

(2) Level and balance of control need to be considered.

(3) Coupling drones with other technologies and interfaces (e.g., AR) could be beneficial.

FUTURE WORK

- Work with SAR workers to **iteratively design** prototypes based on real and imagined use cases
- Evaluate more-refined designs through:
  (1) Shorter-term field experiments
  (2) Longer-term deployments with SAR agencies

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