

# Dr. Mark D. Jacobsen

ENTREPRENEUR · TECHNOLOGIST · WRITER

Montgomery, AL

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## Summary

I am a leader, inventor, and builder who thrives at the intersection of engineering, operational practice, and scholarship. I conceive and execute visions for complex human-technological systems to achieve big ends. During my 22-year U.S. Air Force career, I founded multiple organizations aimed at developing novel airpower and cyberpower concepts. These include a nonprofit that sought to use drone swarms to break sieges and fight starvation in Syria, as well as a cyber exploitation team at the Defense Innovation Unit aimed at stopping the use of drones for terrorism. I helped craft the U.S. government industrial strategy for restoring the American drone industry, and built and fielded a drone detection network across multiple countries. In my teaching I bring together academic scholarship, forward-looking fiction, and a passion for leadership to prepare holistic, transformational leaders. Holds TS/SCI.

## Work Experience

### TILT Autonomy

DIRECTOR OF RESEARCH AND DEVELOPMENT

Various

2024-Present

- Leads software engineering for numerous projects supporting U.S. government clients
- Conceives and develops prototypes to test new product ideas
- Responsible for designing and building a new platform to facilitate simulation and machine learning for integration with unmanned systems

### The Atlantic Council, Forward Defense

Washington, D.C.

NONRESIDENT FELLOW

2023-Present

- Generates ideas and connects stakeholders in the defense ecosystem to promote an enduring military advantage for the United States, its allies, and partners.
- Writes and advises on Atlantic Council projects pertaining to defense technology and the future of war.

### Air Force Center for Strategy and Technology

Maxwell AFB, AL

DEPUTY DIRECTOR OF BLUE HORIZONS

2023-2024

- Helps direct academic program to prepare battle-ready entrepreneurs to U.S. Air Force
- Teaching faculty member and advisor for student-led prototype projects
- Executes \$3.5M per year across student-led tech projects, partnering with industry
- Prototyped CV-enabled maritime search drone using OpenCV/Unreal Engine/PyTorch
- Oversees Master's degree program in Airpower Strategy and Technology Integration
- Reports to USAF Chief of Staff as his "think-and-do tank" at Air University

### Air War College

Maxwell AFB, AL

ASSISTANT PROFESSOR OF STRATEGY AND SECURITY STUDIES

2022-2023

- Assisted with curriculum overhaul for JCS-directed shift to Great Power Studies
- Facilitated first-ever AWC wargame focused on South China Sea military confrontation
- Helped teach Air University-wide Innovation Research Task Force
- Planned faculty development trip to Japan and South Korea with focus on U.S.-China competition in region

### The School of Advanced Air and Space Studies (SAASS)

Maxwell AFB, AL

ASSISTANT PROFESSOR OF STRATEGY AND SECURITY STUDIES

2017-2022

- Winner of 2021 AETC Educator of the Year award
- Course Director for SAASS Technology and Innovation course; revamped course
- Instructor for Irregular Warfare course
- Published book and 50+ articles/blog posts with emphasis on leadership and mental health
- Revamped SAASS alumni program for 550+ grads, established e-books buying program, and led classroom modernization effort for hybrid classes
- Led data science initiative to study and improve discourse on two listservs with 300+ national security experts

## Defense Innovation Unit: Rogue Squadron

Mountain View, CA

### FOUNDER AND DIRECTOR

2017-2020

- Founded and led a 16-person, \$3M/yr agile software development team in the Department of Defense
- Led DevOps transformation of DoD counter-UAS capabilities with AWS GovCloud, GitLab, GitLab CI/CD, Docker, mobile apps
- Personally developed seven app prototypes, then built team to scale them into production
- Helped lead U.S. interagency policy efforts to prevent Chinese monopolization of sUAS industry & enable effective C-UAS response.
- Shaped efforts to revitalize U.S. sUAS industry, including investments in sUAS components, new Army quadcopter program, and initiation of Defense Production Act Title III protection for industry—signed into law
- Provided UAS/C-UAS capability to more than 200 organizations across DoD, other federal agencies, and allied nations
- Built cloud-based C-UAS detection network across multiple countries, providing richest sUAS detection data in DoD
- Led team to successful acquisition by the Defense Digital Service (DDS), a digital transformation team reporting to the Secretary of Defense

## Uplift Aeronautics

Palo Alto, CA

### FOUNDER AND EXECUTIVE DIRECTOR

2014-2015

- Founded and led 501(c)(3) nonprofit corporation aimed at using drones to end sieges in conflict zones
- Created and led open-source, global team of volunteers
- Developed small, fixed-wing drones capable of covert airdrops at 130km round-trip ranges
- Ran successful Indiegogo crowdfunding campaign and global media campaign
- Drove discussions in UN/aid sector on humanitarian drone use in conflict zones
- Developed “responsible use” drone firmware for safe, secure operations in conflict zones

## Defense Entrepreneurs Forum

Chicago, IL

### DIRECTOR OF STRATEGIC COMMUNICATION & FOUNDING BOARD MEMBER

2013

- Helped create new grassroots organization for promoting innovation culture within DoD
- Helped plan inaugural Defense Entrepreneurs Forum annual conference
- Developed communications plan and coauthored pre and post-conference articles

## 21st Airlift Squadron (60th Air Mobility Wing)

Travis AFB, CA

### ASSISTANT DIRECTOR OF OPERATIONS, SQUADRON CHIEF OF STAFF, C-17 INSTRUCTOR PILOT

2011-2013

- Managed staffing, evaluations, and promotions for 150-person flying squadron
- Directed squadron operations for Secretary of Defense travel, hurricane response, and other missions

## 10th Airlift Squadron (62d Airlift Wing)

McChord AFB, WA

### TRAINING MANAGER, EXECUTIVE OFFICER, WING FLIGHT SAFETY OFFICER, C-17 AIRCRAFT COMMANDER

2004-2008

- Flew missions in 20+ countries including aeromedical evacuation, humanitarian relief, presidential travel
- Flew 200+ missions in Afghanistan and Iraq
- Helped run base-level flight safety programs/mishap investigations

## United States Air Force

Various

### OFFICER

2002-Present

- Broad career including a variety of leadership, management, technical, and scholarly roles

# Education

## Stanford University

Stanford, CA

### PHD IN POLITICAL SCIENCE

2014-2017

- Dissertation: “The Scramble for Political Order: State Breakdown and Armed Group Proliferation in Civil War”
- Advisor: Jim Fearon. Committee: Martha Crenshaw, Barry Weingast, Jeremy Weinstein.

## USAF School of Advanced Air & Space Studies (SAASS)

Maxwell AFB, AL

### M.PHIL. IN STRATEGY

2013-2014

- Thesis: “Strategy in Fragmented Wars: Iraq, Syria, and the Challenge of Intervention”
- #1/44 graduates

## The University of Jordan

Amman, Jordan

### M.A. IN CONFLICT RESOLUTION

2009-2011

- Completed MA in Jordanian university, as sole American in most of my classes.
- Coursework was primarily in English, but included several courses entirely in Arabic.
- Completed thesis on competing narratives about Islam in the United States.

## Defense Language Institute

Monterey, CA

### ARABIC BASIC COURSE

2008-2009

- Departure prior to course completion due to in-country language study opportunities.

## Troy State University

Troy, AL

### M.A. IN INTERNATIONAL RELATIONS

2005-2009

## United States Air Force Academy

B.S. IN ASTRONAUTICAL ENGINEERING

Colorado Springs, CO

1998 - 2002

- Program Manager for Department of Astronautical Engineering rocket design program.
- Designed and flight-tested flight control computer for USAFA rockets.
- For my senior project, developed algorithm for detecting position on Mars using only the sun.
- Interned at NASA Jet Propulsion Laboratory

## Honors & Awards

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### SCHOLARSHIPS / FELLOWSHIPS

2009-2011 **Olmsted Scholar**, Olmsted Scholarship Program

Amman, Jordan

### MILITARY

2021 **AETC Educator of the Year**, Air Education and Training Command

Maxwell AFB, AL

2012 **Field Grade Officer of the Quarter**, 60th Airlift Wing

Travis AFB, CA

2004 **Junior Company Grade Officer of the Year**, 62d Airlift Wing

McChord AFB, WA

### ENTREPRENEURSHIP

2014 **1st Place**, Defense Entrepreneurs Forum Innovation Competition

Boston, MA

## Scholarship

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### BOOKS

#### Eating Glass: The Inner Journey Through Failure and Renewal

CONTINUAL ASCENT

2021

### PEER-REVIEWED PUBLICATIONS

#### The Promise of Drones

HARVARD INTERNATIONAL REVIEW

2016

### BOOK REVIEWS

#### The Uses and Limits of Speculative Fiction: Three Novels about a US-China War

JOURNAL OF INDO-PACIFIC AFFAIRS

2023

#### Review: The Rise and Fall of Imperial China by Yuhua Wang

JOURNAL OF INDO-PACIFIC AFFAIRS

2023

### POLICY PAPERS

#### Memorandum of Justification for Defense Production Act Protection of Small Unmanned Aerial Systems

FOR: NATIONAL SECURITY COUNCIL

2019

This white paper went to the White House as part of a DPA Title III package, which was signed by President Trump to authorize DPA protection of the small unmanned aerial system industry.

#### Growing an Alternative to DJI

FOR: DEPARTMENT OF DEFENSE, ACQUISITIONS & SUSTAINMENT

2019

This white paper launched a multi-year effort at the Defense Innovation Unit to provide DoD funding to the embattled small unmanned aerial systems industry and break the emerging monopoly by DJI, a Chinese company.

#### National Security Innovation Capital: Drone Technology Investment Areas

FOR: NATIONAL SECURITY INNOVATION CAPITAL (NSIC)

2018

This white paper outlined investment opportunities for the new National Security Innovation Capital (NSIC) fund to invest in U.S.-based drone technology and help break Chinese monopolization.

### WORKING PAPERS

**The Role of Conventional Deterrence in Civil Wars**

2018

**OTHER ARTICLES**

**Ukraine's drone strikes are a window into the future of warfare**

NEW ATLANTICIST

2023

**The Dubious Prospects for Cargo-Delivery Drones in Ukraine**

WAR ON THE ROCKS

2022

**When You Lose Your Why**

FROM THE GREEN NOTEBOOK

2021

**Strategic Implications of Non-State #WarBots**

THE STRATEGY BRIDGE

2017

**Why the Flying IED Threat Has Barely Started**

WAR ON THE ROCKS

2016

**#Monday Musings**

THE STRATEGY BRIDGE

2016

**How the Syria Airlift Project is Using Open Source Dronecode for Humanitarian Aid**

LINUX.COM

2015

**The Syria Airlift Project**

US NAVAL INSTITUTE PROCEEDINGS

2015

**How to Discover Defense Innovation**

WAR ON THE ROCKS

2014

**Why the Defense Entrepreneurs Forum Matters: Peripheral Networks & Innovation**

WAR ON THE ROCKS

2014

**Constructive Disruption: The Defense Entrepreneurs Forum**

SMALL WARS JOURNAL

2013

**Finding Common Ground: Harnessing Disruption for the Good of the Service**

SMALL WARS JOURNAL

2013

**How to Teach About Islam**

ARMED FORCES JOURNAL

2011

**Some side benefits of learning both a foreign language and a foreign culture**

FOREIGN POLICY: THE BEST DEFENSE

2010

## Teaching Experience

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## COURSE DIRECTOR

### Technology and Military Innovation

SCHOOL OF ADVANCED AIR & SPACE STUDIES

2018-2022

## COURSE INSTRUCTOR

### Taiwan Deterrence Task Force

AIR UNIVERSITY

2023

### Innovation Research Task Force

AIR UNIVERSITY

2022

### Great Power Studies

AIR WAR COLLEGE

2022

### Introduction to Strategic Studies

AIR WAR COLLEGE

2022

### Technology and Military Innovation

SCHOOL OF ADVANCED AIR & SPACE STUDIES

2017, 2023

### Irregular Warfare

SCHOOL OF ADVANCED AIR & SPACE STUDIES

2021-2022

### Strategy to Practice

SCHOOL OF ADVANCED AIR & SPACE STUDIES

2019

## TEACHING ASSISTANT

### International Security in a Changing World (with Amy Zegart)

STANFORD UNIVERSITY

2017

### War and Peace in American Foreign Policy (with Kenneth Schultz)

STANFORD UNIVERSITY

2016

### International Security in a Changing World (with Scott Sagan and Gil-li Vardi)

STANFORD UNIVERSITY

2016

## Simulations and Wargames

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### Assassin's Mace (South China Sea Military Confrontation)

AIR WAR COLLEGE

2022

### Diplomatic Simulation of South China Sea Confrontation (with Amy Zegart)

STANFORD UNIVERSITY

2017

### Diplomatic Simulation of Nuclear Nonproliferation Treaty Renegotiation (with Scott Sagan and Gil-li Vardi)

STANFORD UNIVERSITY

2016

## Presentations and Talks

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## PRESENTATIONS

### **The Evolution of Defense Innovation**

DIRECTOR'S DEVELOPMENT PROGRAM IN LEADERSHIP

*Maxwell AFB, AL*

2022

### **Innovation and the F-Word (Failure)**

DEFENSE ENTREPRENEURS FORUM ANNUAL CONFERENCE

*Virtual*

2021

### **Drone Startup Technology**

CORNELL UNIVERSITY: THE POLITICS OF TECHNOLOGY, WITH SARAH KREPS

*Virtual*

2021

### **Keeping Pace with Drones Inside the U.S. Government**

GLOBAL DRONE SECURITY NETWORK

*Virtual*

2021

### **Swarming Airlift Through Contested Airspace**

AIRLIFT/TANKER ASSOCIATION

*Nashville TN*

2016

### **DIU Rogue Squadron**

NORAD/NORTHCOM VISTA CONDOR II

*Colorado Springs, CO*

2019

### **Transactional Cooperation in Civil Wars**

INTERNATIONAL STUDIES ASSOCIATION ANNUAL CONFERENCE

*San Francisco, CA*

2018

### **The Syria Airlift Project**

HUMANITARIAN TECHNOLOGY CONFERENCE

*Boston, MA*

2016

### **Drones for Humanity**

SAN JOSE MUSEUM OF ART

*San Jose, CA*

2015

### **The Syria Airlift Project**

SAN FRANCISCO ROBOTICS APPLICATION GROUP

*San Francisco, CA*

2015

### **Open-Sourcing Humanitarian Airlift**

NAVAL POSTGRADUATE SCHOOL CONSORTIUM FOR ROBOTICS AND UNMANNED SYSTEMS EDUCATION AND RESEARCH (CRUSER)

*Monterey, CA*

2015

### **Open-Sourcing Humanitarian Airlift**

EMBEDDED LINUX/DRONECODE CONFERENCE

*San Jose, CA*

2015

### **The Israeli-Palestinian Conflict**

THE AIRLIFT/TANKER ASSOCIATION

*Anaheim, CA*

2012

## PODCASTS & MEDIA

### **Delivering Humanitarian Aid Using Drones**

GOVERNMENT MATTERS TV

2022

### **Growth Through Failure**

FROM THE GREEN NOTEBOOK

2022

### **Eating Glass with Mark Jacobsen**

ALWAYS IN PURSUIT

2021

## CFO Bookshelf

AN INNER JOURNEY THROUGH FAILURE AND RENEWAL

2021

## Author Talk with Mark Jacobsen

MINIMUM VIABLE PODCAST

2021

## Fiction Writing

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I combine storytelling and scholarship by writing near-future science fiction. This provides a laboratory in which to explore the social and political implications of new technologies. I consider this an integral part of my broader scholarly contributions.

### The Weight of Oceans

ASIMOV'S SCIENCE FICTION

forthcoming

### The Repair

ASIMOV'S SCIENCE FICTION

2022

### Destroyer of Worlds

INKSTICK MEDIA

2021

### "Celestial Object 143205" in Derelict

ZOMBIES NEED BRAINS LLC

2021

### Fitness Function

CENTER FOR INTERNATIONAL MARITIME SECURITY

2016

### The Wasp Keepers

War Stories, APEX BOOK COMPANY

2014

### The Lords of Harambee

AMAZON CREATESPACE

2012

## Additional Projects

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### Cairn Leadership

MOUNTAIN GUIDE AND LEADERSHIP COACH

2022-Present

- Part-time guide for a company that provides executive leadership education and coaching in the outdoors
- Develops curriculum focused on core leadership competencies
- Leads safe, meaningful multi-day backpacking and rock climbing expeditions for clients of all experience levels

### ArduPilot

VOLUNTEER DEVELOPER

2014-2015

- Volunteer for open-source drone autopilot software used by hundreds of companies
- Contributed code to improve ground control station interface
- Identified crucial flaws in safety failsafes and wrote technical writeup for developers
- Contributed improved documentation to enhance flight safety
- Consulted leadership team on transition to non-profit

### PFPS Google Earth Tool

DEVELOPER

2007-2008

- Designed the first-ever software for integrating Google Earth with DoD flight planning tools.
- The US Air Force Academy Institute for Information Technology adopted my code, and evolved it into a \$1.5M AF program called WEde Viewer, which remains in use today.

## Skills

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**Languages:** Modern Standard and Levantine Arabic - basic working proficiency (DLPT 3/3)

**Technologies:** R, Python, Kotlin, Java, Android, Typescript, AWS, git, GitLab CI/CD, Docker, LaTeX, Jupyter, Shiny, RMarkdown/knitr