

Cover photo

Katharine and Orville Wright sitting in Wright Model H Flyer, created 1914. Used courtesy of Special Collections and Archives, Wright Brothers Collection, Wright State University Libraries. https://corescholar.libraries.wright.edu/special_ms1_photographs/1088/

Description. Katharine Wright, wearing flying goggles, and Orville Wright sitting in a Wright Model H Flyer. Note on back, "Note vertical radiator made out of speaking tubes. Also note brake against wheel."

TABLE OF CONTENTS

ADVANCED AIR MOBILITY

AN ANALYSIS OF INFORMATION REQUIREMENTS FOR PASSENGERS OF (AUTONOMOUS) URBAN AIR MOBILITY VEHICLES Beringer.....	1
HUMAN FACTORS CONSIDERATIONS FOR URBAN AIR MOBILITY Chauhan & Carroll.....	7

ADVANCES IN THE SELECTION OF AIR TRAFFIC CONTROLLERS AND PILOTS VALIDATING STRESS TOLERANCE EXERCISE WITH GAME-BASED ASSESSMENT AND STRESS CHECKLISTS

Wium.....	13
THE ROLE OF A GROUP ASSESSMENT CENTRE IN THE SELECTION OF AB INITIO AIR TRAFFIC CONTROLLERS Eaglestone & Arnold.....	19
MEASURING MOTIVATION IN PILOT TRAINING APPLICANTS Trent & Rose.....	25
USING A PERCEPTUAL SPEED TEST TO PREDICT FLIGHT TRAINING PERFORMANCE: NEW FINDINGS Damos, Bittner, & Niemczyk.....	30

AIRSPACE AND AIR TRAFFIC MANAGEMENT

DECISION SUPPORT TOOLS FOR THE COLLABORATIVE TRAJECTORY OPTIONS PROGRAM Smith, Spencer, Evans, Hoffman, Hackney, & Kicinger.....	36
AIRSPACE COMPLEXITY FOR PILOTS OPERATING IN HIGH-DENSITY TERMINAL AIRSPACE: NEW YORK CASE STUDY Chandra, Sparko, Kendra, & Kochan.....	42
MODELING CONTINGENCY MANAGEMENT IN UNMANNED AIRCRAFT SYSTEMS TRAFFIC MANAGEMENT Barrett & IJtsma.....	48
UAS SAFETY ZONES: A MODEL FOR ADDRESSING INCREASED AIR TRAFFIC CONTROLLER WORKLOAD Jadhav, Lercel, & Hubbard.....	54

ATTENTION, SEARCH, AND SCANNING

APPLYING EYE-TRACKING TECHNOLOGY TO EXPLORE THE VISUAL SCANNING PRACTICES OF AIR TRAFFIC CONTROL TOWER CONTROLLERS
Crutchfield, Kang, & Mandal.....60

SPATIAL-TEMPORAL CLUSTER APPROACH TO DISCOVER VISUAL SCANNING BEHAVIORS IN VIRTUAL REALITY
Kang, Crutchfield, Fraga, & Mandal.....66

MEASURING THE RANGE OF ATTENTION TO PREVIEW AND ITS MOMENTARY PERSISTENCE IN SIMULATED DRIVING
Morrison, Jagacinski, & Petrov.....72

ATTENTIONAL TRAINING IN MULTITASKING FOR UAS SENSOR OPERATORS
Wickens, Sebok, Herdener, Spahr, & Clegg.....73

AVIATION INTERFACE DESIGN

APPLYING HUMAN FACTORS HEURISTIC EVALUATION TOOLS TO IMPROVE AVIATION WEATHER DISPLAYS : A MISMATCH
Kleber, Lawton, & Blickensderfer.....79

ASSESSMENT OF A HORIZONTAL-VERTICAL ANISOTROPY IN UTILIZING AN AIRCRAFT ATTITUDE SYMBOLOGY
Reis, Miller, Geiselman, Dommert, Langhals, Kabban, & Jackson.....80

THE CUSTOMER IS ALWAYS RIGHT...TOWARDS RHINO POINTING AND EYE TRACKING INTERFACES FOR COMBAT AVIATORS
Highland, Harp, Schnell, Geiselman, & Havig.....86

EDUCATION

SURVEYING COLLEGIATE STUDENT PILOTS FOR THEIR PERSPECTIVES ON THEIR COLLEGIATE FLIGHT TRAINING EXPERIENCE
Fala & Whitford.....92

HOW TO TEACH COLLEGE AVIATION STUDENTS ABOUT SITUATION AWARENESS IN A VIRTUAL CLASSROOM SETTING
Dattel, Wang, Booker, Xie, Haris, Xie, & Zhang.....98

COVID-19 IMPACTS ON COLLEGIATE AVIATION TRAINING
Wu & Shila.....104

EXPLORING METHODS TO COLLECT AND ANALYZE HUMAN CONTRIBUTIONS TO SAFETY

EXPLORING METHODS TO COLLECT AND ANALYZE DATA ON HUMAN CONTRIBUTIONS TO AVIATION SAFETY
Holbrook.....110

HOW DO DIFFERENT KNOWLEDGE FRAMEWORKS HELP US LEARN FROM AVIATION LINE OBSERVATIONS?
Mumaw, Billman, & Holbrook.....116

REPORTS OF RESILIENT PERFORMANCE: INVESTIGATING OPERATORS’ DESCRIPTIONS OF SAFETY-PRODUCING BEHAVIORS IN THE AVIATION SAFETY REPORTING SYSTEM
Feldman, Barshi, Smith, & Matthews.....122

RESILIENCE ENGINEERING’S POTENTIAL FOR ADVANCED AIR MOBILITY (AAM)
Nemeth & Holbrook.....128

THINKING OUTSIDE THE BOX: THE HUMAN ROLE IN INCREASINGLY AUTOMATED AVIATION SYSTEMS
Lachter, Hobbs, & Holbrook.....134

EVALUATING THE USE OF HIGH-FIDELITY SIMULATOR RESEARCH METHODS TO STUDY FLIGHT CREW RESILIENCE
Stephens, Prinzel, Kiggins, Ballard, & Holbrook.....140

FLIGHT DECK DISPLAYS AND DECISION MAKING

DISPLAY DESIGN TO AVOID AND MITIGATE LIMIT CYCLE OSCILLATIONS ON THE F-16C
Feibus.....146

OBSERVING ON-DEMAND AIRCREW TRANSITIONING FROM PAPER TO ELECTRONIC FLIGHT BAGS: THE IMPACT ON WORKLOAD
Long & Gildea.....152

FACTORS INFLUENCING PILOT TRUST IN ELECTRONIC FLIGHT BAG INFORMATION
Pittorie, Rebensky, Hunt, Narkushian, Chaparro, & Carroll.....158

HEALTH AND WELL-BEING

THE IMPACT OF THE COVID 19 PANDEMIC ON AVIATION WORKERS AND THE AVIATION SYSTEM
Cahill, Cullen, Anwer, & Gaynor.....164

HUMAN-MACHINE TEAMING

FLIGHT ALLOCATION IN SHARED HUMAN-AUTOMATION EN-ROUTE AIR TRAFFIC CONTROL
de Rooij, Borst, van Paassen, & Mulder.....172

THE IMPACT OF A SYNTHETIC TEAMMATE ON SITUATIONAL AWARENESS
Teo, Fieldhouse, & Niemczyk.....178

VIEWING AIR BATTLE MANAGEMENT THROUGH THE LENS OF INTERDEPENDENCE
Peterson, McGuirl, Miller, Bales, & Sternitzky.....184

ORGANIZATIONAL SAFETY, CULTURE, AND CLIMATE

ORGANIZATIONAL SAFETY IN AIRLINE OPERATIONS
Rantanen & Huijbrechts.....190

ASSESSING THE RELATIONSHIPS BETWEEN ORGANIZATIONAL MANAGEMENT FACTORS (4Ps) AND A RESILIENT SAFETY CULTURE IN A COLLEGIATE AVIATION PROGRAM WITH A SAFETY MANAGEMENT SYSTEMS (SMS)
Adjekum.....196

SAFETY PROGRAMS, SAFETY MANAGEMENT SYSTEMS AND IMPLICATIONS FOR HUMAN PERFORMANCE
Julia Pounds & Krois.....202

PERCEPTION AND PERFORMANCE

EXPLORING THE RELATION BETWEEN DISTRACTOR INHIBITION AND AUDIOVISUAL INTEGRATION
Wang & Fox.....208

SPEED-ACCURACY TRADE-OFFS AND GENERAL SYSTEMS PERFORMANCE THEORY: NOVEL APPLICATION TO FITTS' LAW AND BEYOND
DiSalvi & Kondraske.....214

POSTERS

A SALUTE TO ROBERT KEY DISMUKES: A MENTOR FOR TRANSLATIONAL RESEARCH IN HUMAN FACTORS
Kochan.....220

SYSTEMATIC REVIEW OF WEATHER OBSERVATION AND FORECAST RESOURCES AVAILABLE TO GENERAL AVIATION PILOTS
Wallace & Fala.....226

PILOT IS A PILOT IS A PILOT: EXPLORATION OF EFFECTS OF NATIONAL CULTURE IN HELICOPTER PILOTS Kaminska, Irwin, Ray, & Flin.....	232
UTILIZING IMMERSIVE TECHNOLOGIES IN THE AIR TRAFFIC CONTROL DOMAIN Bajaj, Jorquera, Duff, & Patrick.....	238
TASK MODELING IN AIR TRAFFIC CONTROL WITH TRAJECTORIZED EN-ROUTE TRAFFIC DATA PROCESSING SYSTEM Maeng, Itoh, Hirabayashi, & Senoguchi.....	244
PSYCHOLOGICAL ASPECTS IN PILOT TRAINING: COGNITION AND HUMAN FACTORS Gupta.....	250
A MODEL OF SPACE OPERATOR TRAINING MOTIVATION USING SERIOUS GAMES Davis & Miller.....	256
TRANSITIONING FROM FACE-TO-FACE TO VIRTUAL TRAINING: TRAINEE PERCEPTIONS OF VIRTUAL AIR TRAFFIC TRAINING Torrence, Sanders, & Long.....	262
DOES ATTENTION TRAINING ENHANCE STRESS RESILIENCE AND PERFORMANCE IN UNFORESEEN SAFETY-CRITICAL SITUATIONS? Talker.....	268
HAZARD ANALYSIS FOR HUMAN SUPERVISORY CONTROL OF MULTIPLE UNMANNED AIRCRAFT SYSTEMS Johnson, Kopeikin, Leveson, & Drysdale.....	274
IDENTIFICATION OF A FAILED ENGINE IN TWIN-ENGINE PROPELLER AIRCRAFT: PILOT SURVEYS Babin & Dattel.....	280
LOSS OF SITUATIONAL AWARENESS DURING COMMERCIAL FLIGHT OVER COLOMBIAN MOUNTAINS Mejia.....	286
THE IMPACTS ON THE FLIGHT CREW WITH THE IMPLEMENTATION OF THE AIRBORNE IMAGE RECORDER SYSTEM (AIRs) IN THE COCKPIT Rangel & Fernandes da Costa.....	290
TOWARD MODELING PILOT WORKLOAD IN A COGNITIVE ARCHITECTURE Stevens, Fisher, & Morris.....	293

PROCEDURES IN PRACTICE AND TRAINING

GO-AROUND NONCOMPLIANCE DURING UNSTABILIZED APPROACHES AND LANDINGS IN COMMERCIAL AVIATION: A HUMAN FACTORS ANALYSIS Ross & Tomko.....	299
MODERN PRACTICES FOR FLIGHTCREW TRAINING OF PROCEDURAL KNOWLEDGE Sonnenfeld, Nguyen, Boesser, & Jentsch.....	305
PROCEDURES AS AN ECOLOGICAL INTERFACE Rantanen & Huijbrechts.....	310
VALIDATION OF COMPUTERISED APTITUDE SELECTION SYSTEM (COMPASS) IN PREDICTING SUCCESS OF UAV APPLICANTS IN THE REPUBLIC OF SINGAPORE AIR FORCE (RSAF) Karunakarar, Lim, De Roza, Loi, & Yip.....	316
THE SKILL ASSUMPTION - OVER-RELIANCE ON PERCEPTION SKILLS IN HAZARD ASSESSMENT van Paassen, Reitsma, Huijbrechts, Borst, Landman, & Mulder.....	322
RISK AND HAZARD ANALYSIS	
KNOWN AND UNKNOWN IN AIR TRAFFIC CONTROLLER SAFETY REPORTS: DEVELOPING A NEW METHOD Krois & Pounds.....	328
SYSTEM THEORETIC REQUIREMENTS DEFINITION FOR HUMAN INTERACTIONS ON FUTURE ROTARY-WING AIRCRAFT Yoo, Kopeikin, Gregorian, Munekata, Thomas, & Leveson.....	334
SAFETY	
COMPARING HUMAN AND MACHINE LEARNING CLASSIFICATION OF HUMAN FACTORS IN INCIDENT REPORTS FROM AVIATION Boesser & Jentsch.....	340
EXAMINING THE CHANGING ROLES AND RESPONSIBILITIES OF HUMANS IN ENVISIONED FUTURE IN-TIME AVIATION SAFETY MANAGEMENT SYSTEMS Prinzel, Ellis, Koelling, Krois, Davies, & Mah.....	346
MINIMIZING THE NEGATIVE IMPACTS OF AIRPORT CONSTRUCTION Hubbard, Hubbard, & Sobieralski.....	352
IS OUR CURRENT CERTIFICATION PROCESS A THREAT TO SAFETY INNOVATION? Huijbrechts & van Paassen.....	358

SKILLS DEGRADATION AND ASSESSMENT

BEHAVIORAL INDICATORS IN AIR TRAFFIC CONTROL: DETECTING AND PREVENTING PERFORMANCE DECLINE
Edwards, Seely, Katz, & Lee.....364

THE EFFECT TO HUMAN PERFORMANCE AND WELLBEING OF AIR TRAFFIC MANAGEMENT OPERATIONAL STAFF THROUGH THE COVID-19 PANDEMIC
Vink.....370

DIMENSIONS OF PILOT EXPERIENCE AND THEIR CONTRIBUTING VARIABLES
Udo-Imeh & Landry.....376

INFORMING AVIATION SECURITY WORKFORCE ASSESSMENT AND SELECTION AMIDST THE COVID-19 PANDEMIC
Mitroff & Sharpe.....385

SKILLS TRAINING

SITUATIONAL AWARENESS TRAINING FOR OPERATORS OF UNMANNED AERIAL VEHICLES
Kille, Bates, Lee, & Kille.....391

RECOMMENDED TRAINING PRACTICES TO PREPARE PILOTS TO COPE WITH INFORMATION CONFLICTS
Carroll, Sanchez, & Wilt.....397

TRAINING AIRLINE PILOTS FOR IMPROVED FLIGHT PATH MONITORING: THE SENSEMAKING MODEL FRAMEWORK
Billman, Zaal, Mumaw, Lombaerts, Torron, Jamal, & Feary.....403

WHAT WE KNOW ABOUT TEAMWORK AND MULTITEAM COORDINATION

WHAT WE KNOW ABOUT TEAMWORK AND MULTITEAM COORDINATION IN AVIATION: OVERVIEW MODEL
Littlepage, Hein, & Georgiou.....409

WHAT WE KNOW ABOUT TEAMWORK AND MULTITEAM COORDINATION IN AVIATION: EMERGENT STATES SUPPORTING TEAMWORK IN AVIATION
Littlepage, Hein, & Georgiou.....414

WHAT WE KNOW ABOUT TEAMWORK AND MULTITEAM COORDINATION IN AVIATION: TEAMWORK PROCESSES IN AVIATION
Hein, Littlepage, & Georgiou.....420

WHAT WE KNOW ABOUT TEAMWORK AND MULTITEAM COORDINATION IN AVIATION: TEAMWORK COMMUNICATION AND DECISION MAKING IN AVIATION Hein, Littlepage, & Georgiou.....	426
WHAT WE KNOW ABOUT TEAMWORK AND MULTITEAM COORDINATION IN AVIATION: CONTEXTUAL FACTORS AFFECTING TEAMWORK IN AVIATION Georgiou, Littlepage, & Hein.....	432
WORKLOAD AND SITUATION AWARENESS	
A PASSIVE ELECTROENCEPHALOGRAPHY BRAIN-COMPUTER INTERFACE PREDICTS MENTAL WORKLOAD DURING FLIGHT SIMULATION Fraser, Van Benthem, & Herdman.....	438
IDENTIFYING OPPORTUNITIES FOR AUGMENTED COGNITION DURING LIVE FLIGHT SCENARIO: AN ANALYSIS OF PILOT MENTAL WORKLOAD USING EEG Wilson, Gorji, VanBree, Hoffmann, Tavakolian, & Petros.....	444
METACOGNITIVE SITUATION AWARENESS IN AVIATION Cuevas & Aguiar.....	450
PILOT SITUATION AWARENESS AND RISK OF CRITICAL INCIDENTS USING A NOVEL ONLINE FLIGHT SIMULATION TOOL Brightman, Van Benthem, & Herdman.....	456
THE EFFECTS OF INCREASED VISUAL INFORMATION ON COGNITIVE WORKLOAD IN A HELICOPTER SIMULATOR Innes, Howard, Thorpe, Brown, & Eidels.....	462
DETECTING A LOSS OF SITUATIONAL AWARENESS Pickard, Eidels, Beh, & Blaha.....	468