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SAMPLE RECORD

DIALOG(R)File 35:Dissertation Abstracts Online
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PN= ON-BOARD AUTOMATIC AID AND ADVISORY FOR PILOTS OF
/TI CONTROL-IMPAIRED AIRCRAFT

AU= Author: WAGNER, ELAINE ANN
DG= Degree: PH.D.
PY= Year: 1988
CS= Corporate Source/Institution: MASSACHUSETTS INSTITUTE OF
IC= TECHNOLOGY (0753)
AD= SUPERVISOR: LENA VALAVANI
Source: VOLUME 49/08-B OF DISSERTATION ABSTRACTS
INTERNATIONAL.
PAGE 3310. 261 PAGES

/DE Descriptors: ENGINEERING, AEROSPACE
DC= Descriptor Codes: 0538

/AB This dissertation represents the consideration of the problem of aircraft control failures from a broader, more meaningful viewpoint than with control loop reconfiguration or redesign. The additional considerations involved in making full recoveries from control failures are first categorized. New performance and operating constraints that are best taken into account explicitly are presented, and there is a discussion of the sometimes very important role of explicit post-failure retrim of the aircraft. Because it can be expected that pilots, if unaided, may continue often to be unable to recover aircraft after control failure, these considerations have been cast in the form of knowledge and capabilities that an automatic aid and pilot advisory system should have. Each major element is supported with information from aircraft accident cases and from simulations of post-failure flight of a C-130 aircraft. Because automatic emergency control is seen to be a very significant part of the proposed system, a rule-based expert-type system to find a successful control strategy has been developed for elevator failures on the C-130. This system directs pre-simulation of the control strategy, changing it on the basis of empirical guidelines concerning simple, objective features of the aircraft response to the strategy. As shown in numerous examples, few iterations are required to find successful emergency control. As is discussed, this rule-based approach has no known restrictions with respect to type of aircraft, automatic control also in use, or control failure, as well as length of delay for failure identification. This approach seems to be one that would allow possible use of any remaining control capability, including unusual controls or maneuvering, and of finding the counterintuitive recoveries that, as is shown, are sometimes required. The advisory function of the recovery-aiding system is also described. The issues of pilot interface are discussed, as well as what to calculate to support the advisory during various flight phases. It is believed that the automatic aid and advisory system described, including the rule-based system for finding emergency control, is a good, viable solution to the problem of aircraft control failures.

SEARCH OPTIONS

BASIC INDEX

SEARCH SUFFIX	DISPLAY CODE	FIELD NAME	INDEXING	SELECT EXAMPLES
—	—	All Basic Index Fields	Word	S AEROSPACE
/AB	AB	Abstract ¹	Word	S CONTROL(W)FAILURE?/AB
/DE	DE	Descriptor ²	Word & Phrase	S HEALTH(W)SCIENCES/DE
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—	AN	DIALOG Accession Number		
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DC=	DC	Descriptor Code	Phrase	S DC=0538
DG=	DG	Degree	Phrase	S DG=PH.D.
IC=	IC	Institution Code	Phrase	S IC=0753
LA=	LA	Language ^{4,5}	Phrase	S LA=GERMAN
—	LO	Location of Reference Copy ⁴		
PN=	PN	Publication Number	Phrase	S PN=AADAAIC399734
—	PU	Publisher		
PY=	PY	Publication Year	Phrase	S PY=1988
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UD=	—	Update	Phrase	S UD=9999

³ Advisor included since December of 1988.

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