단국대학교
카피킬러캠퍼스 표절 검사
결과 확인서

확 인
성 명
서 명

아이디	72070621	표절률	15%
소속	건축공학과건축구조		
성명			

검사번호	00023710364	검사일자	2017.06.19 18:08
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검사명	표절검사		
문서명	dissertation.pdf		
비고			

비교범위	[현재 첨부 문서] [카피킬러 DB]
검사설정	표절기준 [10 어절][5 문장], 인용/출처 표시문장 [제외], 법령/성경 포함문장 [제외], 목차/참고문헌 [제외]

검토 의견	

표절률 분석 정보

표절률	전체문장	동일문장	의심문장	인용/출처	법령/성경
15%	1,050	41	197	77	0

비교 문서 정보

번호	표절률	출처정보	비고
1	12%	[카피킬러 DB] Copykiller - 문서명 : 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures - 저자 : 박은천 - 발행 : 서울 : 단국대학교 대학원, 2007.2	
2	10%	[카피킬러 DB] Copykiller - 문서명 : 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 - 저자 : 박은천 - 발행 : 서울: 檀國大學校, 2006	
3	1%	[카피킬러 DB] Copykiller - 문서명 : Real-time Hybrid Test on a Semi-actively Controlled Building Structure Equipped with Full-scale MR Dampers - 저자 : Park, E[Park, Eunchurn];Min, KW[Min, Kyung-Won];Lee, SK[Lee, Sung-Kyung];Lee, SH[Lee, Sang-Hyun];Lee, HJ[Lee, Heon-Jae];Moon, SJ[Moon, Seok-Jun];Jung, HJ[Jung, Hyung-Jo] - 발행 : Dec-2010	
4	1%	[카피킬러 DB] Copykiller - 문서명 : Design of a Bi-directional Tuned Liquid Mass Damper for Controlling Dynamic Responses of Building Structures : 건축구조물의 동적응답제어를 위한 2방향 동조액체질량감쇠기 설계 - 저자 : 허재성 - 발행 : 서울 : 단국대학교 대학원, 2008	
5	1%	[카피킬러 DB] iiav.org - 문서명 : Unified Semiactive Control System Based on MR Damper for Cable ...	

검사 문서	비교 문서
문장표절률: **70%** The actuator force is calculated by using the inverse transfer function of a targe tstructural xv ABSTRACT responses to the actuator.	[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures 저자 : 박은천 발행 : 서울 : 단국대학교 대학원, 2007.2 The actuator force is calculated by using the inverse transfer function of a targe tstructural response to the actuator.
문장표절률: **56%** Filter and envelope function are used such that the error between wind and actuator induced responses is minimized by preventing the actuator from the exciting, unexpected modal responses and initial transient responses.	[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures 저자 : 박은천 발행 : 서울 : 단국대학교 대학원, 2007.2 Filter and envelop function are used such that the error between wind and actuator induced responses is minimized by preventing the shaker from exciting unexpected modal responses and initial transient responses- The effectiveness of the proposed method is verified through a numerical example of a 76 story-bcnchmark building excited by wind load of which deterministic time history is given.
문장표절률: **92%** The analyses result from a 76-story benchmark building problem in which wind load obtained by wind tunnel test is given, indicate that the actuator installed at a particular floor can approximately embody the structural responses induced by the wind load applied to each floor of the structure.	[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures 저자 : 박은천 발행 : 서울 : 단국대학교 대학원, 2007.2 The analyses results from a 76-story benchmark building problem in which wind load obtained by wind tunnel test is given, indicate that the actuator installed at a specific floor can approximately embody the structural responses induced by the wind load applied to each floor of the structure· The actuator designed by the proposed method can be effectively used for evaluating the wind response characteristics of a practical buildingstructure and for obtaining an accurate analytical model of the building under wind load. [Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 저자 : 박은천 발행 : 서울: 檀國大學校, 2006 The analyses results from a 76-story benchmark building problem in which wind load obtained by wind tunnel test is given, indicate that the actuator installed at a specific floor can approximately embody the structural responses induced by the wind load applied to each floor of the structure.
문장표절률: **92%** The actuator designed by the proposed method can be effectively used for evaluating the wind response characteristics of a buildingstructure in use and for obtaining an accurate analytical model of the build- ing under wind load.	[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures 저자 : 박은천 발행 : 서울 : 단국대학교 대학원, 2007.2 The analyses results from a 76-story benchmark build ing problem in which wind load obtained by wind tunnel test is given, indicate that the actuator installed at a specific floor can approximately embody the structural responses induced by the wind load applied to each floor of the structure· The actuator designed by the proposed method can be effectively used for evaluating the wind response characteristics of a practical buildingstructure and for obtaining an accurate analytical model of the build ing under wind load. [Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 저자 : 박은천 발행 : 서울: 檀國大學校, 2006 The actuator designed by the proposed method can be effectively used for evaluating the wind response characteristics of a practical buildingstructure and for obtaining an accurate analytical model of the build ing under wind load.
문장표절률: **94%** Secondly, a full scale forced vibration test simulating earthquake response isimplemented by using a hybrid mass damper.	[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 저자 : 박은천 발행 : 서울: 檀國大學校, 2006 Finally, in the chapter 6, a full scale forced vibration test simulating earthquake response isimplemented by using a hybrid mass damper. [Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures 저자 : 박은천 발행 : 서울 : 단국대학교 대학원, 2007.2

Finally, in the chapter 6, a full scale forced vibration test simulating earthquake response isimplemented by using a hybrid mass damper.

문장표절률: **56%**

The finite element model of the real-scaled buildingstructure was analytically constructed, and the model was updated using the results experimentally measured by the forced vibration test.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

The finite element(FE) model of the structure was analytically constructed using ANSYS and the model was updated using the results experimentally measured by the forced vibration test.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

The finite element(FE) model of the structure was analytically constructed using ANSYS and the model was updated using the results experimentally measured by the forced vibration test.

문장표절률: **45%**

Pseudo-earthquake excitation tests showed that the hybrid mass damper induced floor responses coincided with the earthquake induced ones which were numerically calculated based on the updated FE model.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Pseudo-earthqiiake excitation tests showed that HMD hybrid mass damper induced floor responses coincided with the earthquake induced ones which was numerically calculated based on the updated FE model.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Pseudo-earthquake excitation tests showed that HMD hybrid mass damper induced floor responses coincided with the earthquake induced ones which was numerically calculated based on the updated FE model.

문장표절률: **60%**

First, the force required to drive the displacement of the story, at which the MR damper is located, xvi ABSTRACT is measured from the load cell attached to the UTM.

[Copykiller] Real-time Hybrid Test on a Semi-actively Controlled Building Structure Equipped with Full-scale MR Dampers

저자 : Park, E[Park, Eunchurn];Min, KW[Min, Kyung-Won];Lee, SK[Lee, Sung-Kyung];Lee, SH[Lee, Sang-Hyun];Lee, HJ[Lee, Heon-Jae];Moon, SJ[Moon, Seok-Jun];Jung, HJ[Jung, Hyung-Jo]
발행 : Dec-2010

First, the force required to drive the displacement of the story, at which the MR damper is located, is measured from the load cell attached to the UTM.

문장표절률: **100%**

The measured force is then returned to a control computer to calculate the response of the numerical substructure. Finally, the experimental substructure is excited by the UTM with the calculated response of the numerical substructure.

[Copykiller] Real-time Hybrid Test on a Semi-actively Controlled Building Structure Equipped with Full-scale MR Dampers

저자 : Park, E[Park, Eunchurn];Min, KW[Min, Kyung-Won];Lee, SK[Lee, Sung-Kyung];Lee, SH[Lee, Sang-Hyun];Lee, HJ[Lee, Heon-Jae];Moon, SJ[Moon, Seok-Jun];Jung, HJ[Jung, Hyung-Jo]
발행 : Dec-2010

The measured force is then returned to a control computer to calculate the response of the numerical substructure. Finally, the experimental substructure is excited by the UTM with the calculated response of the numerical substructure.

문장표절률: **77%**

The hybrid testing method implemented in this study is validated because the hybrid testing results obtained by application of sinusoidal and earth- quake excitations and the corresponding analytical results obtained using the Bouc-Wen model as the control force of the MR damper with respect to input currents are in good agreement.

[Copykiller] Real-time Hybrid Test on a Semi-actively Controlled Building Structure Equipped with Full-scale MR Dampers

저자 : Park, E[Park, Eunchurn];Min, KW[Min, Kyung-Won];Lee, SK[Lee, Sung-Kyung];Lee, SH[Lee, Sang-Hyun];Lee, HJ[Lee, Heon-Jae];Moon, SJ[Moon, Seok-Jun];Jung, HJ[Jung, Hyung-Jo]
발행 : Dec-2010

The RT-HYTEM implemented in this study is validated because thereal-time hybrid testing results obtained by application of sinusoidal and earth quake excitations and the corresponding analytical results obtained using the Bouc-Wen model as the control force of the MR damper with respect to input currents are in good agreement.

문장표절률: **81%**

Also, the results from the hybrid testing method for the passive -on and -off controlshow that the structural responses did not decrease further by the excessive control force, but de- creased due to the increase of the current applied to the MR damper.

[Copykiller] Real-time Hybrid Test on a Semi-actively Controlled Building Structure Equipped with Full-scale MR Dampers

저자 : Park, E[Park, Eunchurn];Min, KW[Min, Kyung-Won];Lee, SK[Lee, Sung-Kyung];Lee, SH[Lee, Sang-Hyun];Lee, HJ[Lee, Heon-Jae];Moon, SJ[Moon, Seok-Jun];Jung, HJ[Jung, Hyung-Jo]
발행 : Dec-2010

Also, the results from RT-HYTEM for the passive -on and -off controlshow that the structural responses did not decrease further by the excessive control force, but de creased due to the increase of the current applied to the MR damper.

문장표절률: **78%**

[Copykiller] Real-time Hybrid Test on a Semi-actively Controlled Building St

Also, two semi-active control algorithms (modulated homogeneous friction and the clipped-optimal control algorithms) are applied to the MR damper to optimally control the structural responses.

ructure Equipped with Full-scale MR Dampers
저자 : Park, E[Park, Eunchurn];Min, KW[Min, Kyung-Won];Lee, SK[Lee, Sung-Kyung];Lee, SH[Lee, Sang-Hyun];Lee, HJ[Lee, Heon-Jae];Moon, SJ[Moon, Seok-Jun];Jung, HJ[Jung, Hyung-Jo]
발행 : Dec-2010

Also, two semi-active control algorithms (modulated homogeneous friction and the clipped-optimal control algorithms) are applied to the MR damper in order to optimally control the structural responses.

문장표절률: **68%**

To compare the hybrid testing method and numerical results, Bouc-Wen model parameters are identified for each input current.

[Copykiller] Real-time Hybrid Test on a Semi-actively Controlled Building Structure Equipped with Full-scale MR Dampers
저자 : Park, E[Park, Eunchurn];Min, KW[Min, Kyung-Won];Lee, SK[Lee, Sung-Kyung];Lee, SH[Lee, Sang-Hyun];Lee, HJ[Lee, Heon-Jae];Moon, SJ[Moon, Seok-Jun];Jung, HJ[Jung, Hyung-Jo]
발행 : Dec-2010

To compare the RT-HYTEM and numerical results, Bouc-Wen model parameters are identified for each input current. The results of the comparison of experimental and numerical responses show that it is more practical to use RT-HYTEM in semi-active devices such as MR dampers.

문장표절률: **60%**

The results of the comparison of experimental and numerical responses show that it is more practical to use the hybrid testing method in semi-active devices such as MR dampers.

[Copykiller] Real-time Hybrid Test on a Semi-actively Controlled Building Structure Equipped with Full-scale MR Dampers
저자 : Park, E[Park, Eunchurn];Min, KW[Min, Kyung-Won];Lee, SK[Lee, Sung-Kyung];Lee, SH[Lee, Sang-Hyun];Lee, HJ[Lee, Heon-Jae];Moon, SJ[Moon, Seok-Jun];Jung, HJ[Jung, Hyung-Jo]
발행 : Dec-2010

To compare the RT-HYTEM and numerical results, Bouc-Wen model parameters are identified for each input current. The results of the comparison of experimental and numerical responses show that it is more practical to use RT-HYTEM in semi-active devices such as MR dampers.

문장표절률: **62%**

The test results indicate that a control algorithm can be experimentally applied to the MR damper using the hybrid testing method.

[Copykiller] Real-time Hybrid Test on a Semi-actively Controlled Building Structure Equipped with Full-scale MR Dampers
저자 : Park, E[Park, Eunchurn];Min, KW[Min, Kyung-Won];Lee, SK[Lee, Sung-Kyung];Lee, SH[Lee, Sang-Hyun];Lee, HJ[Lee, Heon-Jae];Moon, SJ[Moon, Seok-Jun];Jung, HJ[Jung, Hyung-Jo]
발행 : Dec-2010

The test results show that a control algorithm can be experimentally applied to the MR damper using RT-HYTEM. This article provides a discussion on each algorithm with respect to the seismic performances.

문장표절률: **95%**

The structural responses of the in- teractionsystem are calculated numerically in real-time using the analytical structural model with the excitations of measured control force, user-defined base earthquake loads, and its statespace realization incorporated in the in- tegrated controller of an actuator.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계
저자 : 박은천
발행 : 서울: 檀國大學校, 2006

The structural responses of the in teractionsystem are calculated numerically in real time using the analytical structural model with the excitations of measured control force, user-defined base earthquake loads, and its statespace realization incorporated in the in tegrated controller of the shaking table.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

The structural responses of the in teractionsystem are calculated numerically in real time using the analytical structural model with the excitations of measured control force, user-defined base earthquake loads, and its statespace realization incorporated in the in tegrated controller of the shaking table.

문장표절률: **33%**

Also, in order to minimize the distortion of the acceleration of the shaking table or an actuator's displacement, the inverse transfer function of the shaking table or the actuator is identified and its statespace realization isimplemented in the hybrid testing method controller.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계
저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Also, in order to minimize the distortion of the acceleration of the shaking table, the inverse transfer function of the shaking table is identified and its statespace realization isimplemented in the shaking table controller.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Also, in order to minimize the distortion of the acceleration of the shaking table, the inverse transfer function of the shaking table is identified and its statespace realization isimplemented in the shaking table controller.

문장표절률: **64%**

Secondly, in chapter 3, simulation of dynamic responses of a buildingstructure u

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

sing a linear mass shaker is conducted. In order for the linear shaker to keep the structure in the target response trajectory, an inverse transfer function of a structural response to the shaker force is obtained us- ing a statespace form governing equation of the structure and the discrete Fourier transform of structural response is performed.

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

1. In order for the linear actuator to keep the structure in the target response trajectory, an inverse transfer function of a structural response to the shaker force is obtained us ing a statespace form governing equation of the structure and the discrete Fourier transform of structural response is performed.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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In order for the linear actuator to keep the structure in the target response trajectory, an inverse transfer function of a structural response to the shaker force is obtained us ing a statespace form governing equation of the structure and the discrete Fourier transform of structural response is performed.

문장표절률: **61%**

Filter and envelope function are used such that the error between wind and actuator induced responses is minimized by preventing the shaker from the exciting unex- pected modal response and initial transient response.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Filter and envelop function are used such that the error between wind and actuator induced responses is minimized by preventing the shaker from exciting ime^ected modal response and initial transient response.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Filter and envelop function are used such that the error between wind and actuator induced responses is minimized by preventing the shaker from exciting unex pected modal response and initial transient response.

문장표절률: **100%**

The effectiveness of the proposed method is verified through a numerical example of a 76 story- benchmark building excited by wind load of which deterministic time history is given.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

The effectiveness of the proposed method is verified through a numerical example of a 76 story- benchmark building excited by wind load of which deterministic time history is given.

문장표절률: **67%**

This study presents the quantitative evaluation of the seismic performance of a build- ing structure installed with a MR damper using hybrid testing method.

[Copykiller] Real-time Hybrid Test on a Semi-actively Controlled Building Structure Equipped with Full-scale MR Dampers

저자 : Park, E[Park, Eunchurn];Min, KW[Min, Kyung-Won];Lee, SK[Lee, Sung-Kyung];Lee, SH[Lee, Sang-Hyun];Lee, HJ[Lee, Heon-Jae];Moon, SJ[Moon, Seok-Jun];Jung, HJ[Jung, Hyung-Jo]
발행 : Dec-2010

This article presents the quantitative evaluation of the seismic performance of a build ing structure installed with a magnetorheological MR damper using RT-HYTEM.

문장표절률: **83%**

A building modelis identified from the forced vibration testing results of a full-scale five-story building and is used as the numerical substructure, and an MR damper corresponding to an experimental substructure is physically tested using a universal testing machine (UTM).

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First, the force required to drive the displacement of the story, at which the MR damper is located, is measured from the load cell attached to the UTM.

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The measured force is then returned to a control computer to calculate the respo nse of the numer- ical substructure. Finally, the experimental substructure is excit ed by the UTM with the calculated response of the numerical substructure.

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The hybrid testing method implemented in this study is validated because the hyb rid testing results obtained by application of sinusoidal and earthquake excita- ti ons and the corresponding analytical results obtained using the Bouc-Wen mod el as the control force of the MR damper withinput currents are in good agreem ent.

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문장표절률: **83%**

Also, the results from hybrid testing method for the pas- sive -on and -off cont rolshow that the structural responses did not decrease further by the excessive c ontrol force, but decreased due to the increase of the current applied to the MR damper.

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문장표절률: **100%**

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문장표절률: **100%**

However, their study is based on numerical verification, and also has several lim itations for being applied to real-scaled structures.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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문장표절률: **100%**

First, forced vibration tests are not appropriate for utilizing the vibration source with large amplitude in the experimental structure.

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문장표절률: **100%**

Especially, the structure cannot be excited to its nonline arrange, since safety ma y not be ensured during the test and the linear structural modelis used for the nu merical simulation.

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문장표절률: **73%**

Secondly, it is inappropriate for using the vibration source with full bandwidth. Thirdly, sensors may not be sufficiently deployed in field test due to expenses and their installations so that the structural members, in which critical behaviors are expected, are detected.

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문장표절률: **91%**

Finally, the process of obtaining the system matrix of a structure by using the system identification techniqueshould be additionally included in the entire research work, since the structure is based on an analytical model.

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문장표절률: **100%**

Accordingly, the validity of the proposed pseudo-earthquake excita- tion test needs to be experimentally investigated under these constraints.

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문장표절률: **91%**

Dyke et al. (1994) obtained controller canonical form statespace realiza- tion for a small scale three-story building by using both active mass driver and shaking table and measuring the absolute floor acceleration.

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y using both active mass driver and shaking table and measuring the absolute fl oor acceleration.

문장표절률: **75%**

The necessity of testing the upper substructure is found in diverse structures. For exam- ple, the wind-induced acceleration response of slender buildingstructures is usually tremendous in the top story, and detailed experiment for this upper par t of the buildingstructure may be required, since excessive acceleration response may be harmful to human comfort or high precision equipment.

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For exam ple, the wind-induced acceleration response of slender buildingstructures is usually very large in the top story and detailed experiment for this upper part of the buildingstructure may be required, since excessive acceleration response may be harmful to human comfort or high precision equipments.

문장표절률: **100%**

Also, in some cases, a light appendage, for example, a penthouse, a small housing for mechanical equipment and an advertising billboard, may vibrate excessively rather than the primary structure.

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Also, in some cases, a light appendage, for example, a penthouse, a small housing for mechanical equipment and an advertising billboard, may vibrate excessively rather than the primary structure.

문장표절률: **44%**

Besides, to suppress excessive vibration induced by winds and earthquakes, a tuned mass damper or tuned liquid damper is employed on the top story of the high-rise building, and 11 Chapter.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
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Besides, to suppress excessive vibration induced by winds and earthquakes, a tuned mass damper (TMD) or tuned liquid damper (TLD) is employed on the top story of the high-rise building and its performance should be verified in the laboratory before installation.

문장표절률: **62%**

2. Hybrid Testing Method its performance should be verified in the laboratory before installation. Fi- nally, the base isolation system to protect expensive machinery housed in a buildingstructure needs experimental verification for a certain level of earthquake.

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Fi nally, the base isolation system to protect expensive machinery housed in a buildingstructure needs experimental verification for a certain level of earthquake.

문장표절률: **36%**

$POUSPM 1$ TVOCVTNUSFVSDJDUVBSMF NJOFUBFTSVGBSDFFN GFPOSDU FPG PDGP BOOUS BPDM UTVJHBOUPBSM FTVYQCFTSUJSNVDFUOVUSBFM XIPMF TUSVDUVSF FYQFSJNFOUBM TZTUFN (a) conventional method FTVYQCFTSUJSNVDFUOVUSBFM TVOCVTNUSFVSDJDUBVMSF GFTFJEHCOBBDM L DTPJHOOUSBPMM TIBLJOH UBCMF $POUSPM 1$ XIPMF TUSVDUVSF FYQFSJNFOUBM TZTUFN (b) proposed method Figure 2.1: Conceptual illustrations of the substructuring methods On these backgrounds, this subsection proposes a shaking tabletest- ing method using the upper part of a buildingstructure as the experimen- tal substructure based on the acceleration feedback from the experimental substructure.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
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Conceptual illustrations of the real-time substructuring methods On these backgrounds, this paper proposes a shaking tabletest ing method using the upper part of a buildingstructure as the experimen tal substructure based on the acceleration feedback from the experimental substructure.

문장표절률: **76%**

At first, the interface force act- ing between the upper experimental and lower numerical substructures is calculated based on the acceleration feedback of the experimental substruc- ture which is mounted on shaking table.

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At first, the interface force act ing between the upper experimental and lower numerical substructures is calculated based on the acceleration feedback of the experimental 9 2.

문장표절률: **68%**

Then the interface acceleration 12 Chapter. 2. Hybrid Testing Method required to replicate the dynamic behavior of the whole structure is calcu- lated from the numerical substructuresubjected to the interface force and assumed basemotion for the entire structure.

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REAL-TIME SUBSTRUCTURING TECHNIQUEsubstructure which is mounted on shaking table. Then the interface acceleration required to replicate the dynamic behavior of the whole structure is calcu lated from the numerical substructures ubjected to the interface force and assumed basemotion for the whole structure.

문장표절률: **100%**

Finally, shaking table excites the upper experimental substructure according to the commandsignal from the shaking table controller.

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Finally, shaking table excites the upper experimental substructure according to the commandsignal from the shaking table controller.

문장표절률: **71%**

The series of above processes are performed during a single time interval and re peated over the entire duration of the experiment.

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문장표절률: **20%**

(Measuring) Y&& 5 Y&& 4 Y&& 3 Control computer Twhthh e ei dc ihny t ni esra mn faecie e c d be a ed cc h t eol erreaptliiocna, t e whole struct avior of (C alcuulrae.ting) resfiegrneanlce Shakin Shaking table csiognntarlol (gL toaabdlei ncogn)troller Figure 2.2: Schematic diagram of the proposed method 2.1.1 For mulation and Implementation Methodology Experimental and Numerical Substru ctures This subsection addresses physical interpretation and formulation of split − ting the whole structure into the experimental and numerical substructures.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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Schematic diagram of the proposed method 2.2 Formulation and Implementatio n Methodology 2.2.1 Experimental and Numerical Substructures This section ad dresses physical interpretation and formulation of split ting the whole structure in to the experimental and numerical substructures.

문장표절률: **50%**

A two−step process is carried out to formulate the equations of motion for thos e two substructures; separating the experimental substructure from the whole str ucture and constructing experimental substructure mounted on the shaking table and numerical substructures with external loads on the cutting plane, as shown i n Figure 2.3.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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문장표절률: **35%**

The equation of motion of the whole shear−type buildingstructure sub− jected to the ground acceleration, Ÿg(t), is represented in Figure 2.3(a) and expressed as MŸ(t) + CẎ(t) + KY(t) = p(t) (2.1) 13 Chapter.

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발행 : 서울 : 단국대학교 대학원, 2007.2

3. The equation of motion of the whole shear−type buildingstructure sub jected t o the · 馨 ground acceleration, Yq (t), is represented in Fig.

문장표절률: **23%**

2. Hybrid Testing Method { where, Y(t) is the nx}1 vector of the absolute floor displacements givenby {Y1, Y2, ..., Yn}〉, and p(t) is the nx1 vector of the extern al force given by〉 0, ..., 0, c1Yg(t) + k1Yg(t) , M, C and K are the structural m ass, damping and stiffness matrices, respectively, and expressed as follows.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

3 (a) and expressed as [M]{Y(t)}HC^ (2A) where, Y(t) is the nx₩ vector of the absolute floor displacements givenby {7PF2,···, 匕}7, and pit) is the nx₩ vector of the external force given by 0, 0, M C and |A:| are the structural mass, damp ing and stiffness matrices, respectively, and expressed as follows.

문장표절률: **16%**

mn M = cn cn n−1 . . . mm mm−1 . , . . m1 cn cn+cn 1 cn 1 m . . . . C = − . c m+1 cm+1+c −cm kn −kn − cm c (2.2)m+cm−1 −cm−1 . , ... −c2 c2+c1 k n kn+kn 1 kn 1 . . . . K = −km+1 k +1 m −km km km km−1 −km−1 . . .. −k2 k2+k1 The experimental and numerical substructures are separated from th e whole structure by cutting at their interface, as shown in Figure 2.3(b).

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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mn C" − Cn − 지 Q+Q 니 −巧 · · 令 # · · · · · kn 一 kn n n · 參 2.2)m m −I · · · ^m− rl ' wr7J ^in − c c + c − c '·/if ^≫n−l · · · · 馨 C2+Cl− −₩이 우, r+l +^m 니L − & k + k − k · · · · · · · · · 一 k0 kj + ky The experimental and numerical substructures arc separated from the whole structure by cutting at their interface, as shown in Fig.

문장표절률: **100%**

Mathematically, this operation means separating the equations included in Eq. (2 .1) into two groups of which one corresponds to the upper part DOF, and the ot her corresponds to the lower part DOF.

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2.3 (b). Mathematically, this operation means separating the equations included i n Eq. (2.1) into two groups of which one corresponds to the upper part DOF an d the other corresponds to the lower part DOF.

문장표절률: **36%**

The dotted line in Eq. (2.2) divides those two groups, and the resulting two equa tions of motions are written as MEŸE(t) + CE(t)ẎE(t) + KEYE(t) = pE(t) (2.3) MNŸN (t) + CN (t)ẎN (t) + KNYN (t) = pN (t) (2.4) where, subscripts E and N denote the experimental and numerical sub− structur} {es, respectively.

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The dotted line in Eq. (2.2) divides those two groups and the resulting two equat ions of motions are written as M e]{Yf)HC^ (2.3) 11 2. REAL−TIME SUBSTRU CTURING TECHNIQUE [Mn]{Yn}HCn]{Y^ (2.4) where, subscripts and W de note the experimental and numerical sub structur es, respectively.

문장표절률: **100%**

(2.7) that the absolute acceleration of the top story of the numerical substructure

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acts as the ground acceleration of the experi- mental substructure given by Eq.

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Concept of the proposed method It is obvious from Eq. (2.7) that the absolute a cceleration of the top story of the numerical substructureacts as the ground acc eleration of the experi mental substructure given by Eq.

문장표절률: **63%**

(2.3). This condition is physically realized by synchronizing the shaking tablemoti on with the absolute acceleration of the top story of the numerical substructure.

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(2.3). This condition is physically realized by syiicluomzing the shaking tablemoti on with the absolute acceleration of the top story of the numerical substructure.

문장표절률: **14%**

Besides, the first element of the external force vector in Eq. (2.8) means the inter face force acting on the top 15 Chapter. 2. Hybrid Testing Method) Y m E(l) (t E(l) Y m E(l) (t) E(l) E(l□1)(t) mE(l□1) YE(l□1)(t) mE(l□1) esuxbpsetrriumcet unrtael) YE(1)(t mE(1) Yn(t) mn cutting at YE(1)(t) mE(1) YN(m)(t) m)(t Yn□ 1(t) Y mn□1 m N(N(m) Y m N(m) (t) N(m) N(m□1)(t) Y m2(t) N(m□1) m2 YN(m□1)(t) numerical mN(m□1) YN(1)(t) YN(1)(t) Y1(t) m1 mN(1) Yg(t) Y g(t) mN(1) Yg(t) (a) Whole struc- (b) Separation of whole (c) Experimental and numerical sub- ture structurestructure Figure 2.3: Concept of the proposed meth odstory of the numerical substructure.

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Besides, the first element of the external force vector in Eq. (2.8) means the inter face force acting on the top story of the numerical substructure.

문장표절률: **100%**

This interface force, which is denoted by i(t) from now on, is produced by the d amping and restoring forces of the first story in the upper(experimental su)bstru ctu(re andrewritte)n as follows.

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(2.8) means the interface force acting on the top story of the numerical su bstru ctu re. This interface force, which is denoted by i(t) from now on, is produced b y the damping and restoring forces of the first story in the upper experimental su bstructu re andrewritte n as follows.

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This interface force, which is denoted by i(t) from now on, is produced by the d amping and restoring forces of the first story in the upper experimental su bstruc tu re andrewritte n as follows.

문장표절률: **39%**

i(t) = cE(1) YE(1) − YN(m) + kE(1) YE(1) − YN(m) (2.9) As a result, the numer ical substructure, of which equation of motion is given by Eq. (2.4), is subjected to both the interface force at the top story and the ground motion at the base.

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(2.4), is subjected to both the interface force at the top story and the ground mo tion at the base. The boundary condition and external load of each substructure are illustrated in Fig.

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(2.4), is subjected to both the interface force at the top story and the ground mo tion at the base. The boundary condition and external load of each substructure are illustrated in Fig.

문장표절률: **38%**

The boundary condition and external load of each substructure are illustrated in Figure 2.3(c). Measurement of the interface force In this section, the interface fo rce, i(t), which should be fed-back to the nu- merical substructure for calculatin g the interface acceleration, is indirectly measured by the accelerometers attache d on the experimental substructure, as shown in Figure 2.1.

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2.3 c). 2.2.2 Measurement of the interface force In this study the interface force, i t), which should be fed-back to the nu merical substructure for calculating the i nterface acceleration, is indirectly measured from the accelerometers attached o n the experimental substructure, as shown in Fig.

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2.3 c). 2.2.2 Measurement of the interface force In this study the interface force, i(t), which should be fed-back to the nu merical substructure for calculating the interface acceleration, is indirectly measured from the accelerometers attached o n the experimental substructure, as shown in Fig.

문장표절률: **100%**

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시

Dynamic equilibrium in the experimental substruc− ture is applied to derive the int erface force using acceleration response mea− surement of the experimental sub structure.

스템 설계

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발행 : 서울: 檀國大學校, 2006

2.2. Dynamic equilibrium in the experimental substruc ture is applied to derive the interface force using acceleration response mea surement of the experimental su bstructure.

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저자 : 박은천
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2.2. Dynamic equilibrium in the experimental substruc ture is applied to derive the interface force using acceleration response mea surement of the experimental su bstructure.

문장표절률: **80%**

As shown in Figure 2.4, dynamic equilibrium in the experimental substructure is e stablished between the in− terface force acting at its base and the resultant of its inertial forces, because internal forces between each story are canceled with eac h other.

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저자 : 박은천
발행 : 서울: 檀國大學校, 2006

As shown in Fig. 2.4, dynamic equilibrium in the experimental substructure is esta blished between the in terface force acting at its base and the resultant of its inert ial forces, because internal forces between each story are cancelled with each ot her.

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As shown in Fig. 2A, mic equilibrium in the experimental substructure is establish ed between the in terface force acting at its base and the resultant of its inertial f orces, because internal forces between each story are cancelled with each other.

문장표절률: **57%**

This relation can be derived in another way. First, the dotted parts are shown in Eq. (2.5) aremoved to the rightside of Eq. (2.3). Then therelation of Eq.

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This relation can be derived in another way. First, the dotted parts shown in Eq. (2.5) aremoved to the rightside of Eq. (2.3). Then therelation of Eq.

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This relation can be derived in another way. First, the dotted parts shown in Eq. (2.5) aremoved to the rightside of Eq. (2.3). Then therelation of Eq.

문장표절률: **44%**

(2.9) is 16 Chapter. 2. Hybrid Testing Method applied to the rightside. Finally, th e summation of l simultaneous equations for each side gives following expressio n of the interface force, i(t).

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(2.9) is applied to the rightside. Finally, the summation of I simultaneous equatio ns for each side gives following expression of the interface force, i t) · /(0=−Sm £(/)^(/) (2−10) /=i Eq.

문장표절률: **72%**

Σl i(t) = − mE(i)ŸE(i) (2.10) i=1 Eq. (2.10) physically implies that the interface f orce, which is required as an input data of the numerical substructure, can be cal culated using the measured acceleration responses of the experimental substruct ure.

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(2.10) physically implies that the interface force, which is required as an input da ta of the numerical substructure, can be calculated using the measured accelerati on responses of the experimental substructure.

문장표절률: **88%**

u(t) is the 2 x 1〉 vector of input variables given by i(t), Ÿg(t) , in which the interf ace force, i(t), is fed−back from the experimental substructure using Eq.

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{u(t) is the 2 x 1 vector of input variables given by {/(r), YAt)}1 , in which the int erface force, i(t), is fed−back from the experimental substructure using Eq.

문장표절률: **48%**

(2.10). O(t) 17 Chapter. 2. Hybrid Testing Method is the mx 1 vector of the out put composed of the absolute accelerations of the numerical substructure.

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저자 : 박은천
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(10). (0(/)} is the mxl vector of the output composed of the absolute acceleratio ns of the numerical substructure. The system matrices [A], [S], [C] and [D] have the dimension of 2mx2m, 2m x 2, mx 2m and m x 2,respectively, and are expres sed as [A] [0L [II (2.12) [B] {0} , {0} [A/v]〉}, {−1} (2.13) [C] = [−[MNy[[K, l −[Mj−'tcj [D] = [[MN]−₩b)9 {0}] (2.14) (2.15) where, [0] and [I] are mx m zero and unit matrices, respectively, and {0} and {−1} are an mxl vector of 0 and an mxl vector respectively, {b} is an mxl vector given by {1,0, ⋯,0}r.

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(10). {0(t)} is the mXl vector of the output composed of the absolute acceleratio ns of the numerical substructure. The system matrices [A], [B], [C] and [D] hav e the dimension of 2m x 2m , 2m x 2, mx 2m and m x 2,respectively, and are ex pressed as [시 [이麻 {mny[[kni [A네]] (2.12) [B] {0} , {0} [MNYl{b}9 {−1} (2.13) [C] = [−[MNT'[KNl −[M(Vr'[Cv]] [D] = [[MNTl{b}9 {0}] (2.14) (2.15) where, |0| and |7| are mxm zero and^init matrices, respectively, and {0} and {−1} are an nixl vector of 0 and an mxl vector of −1,respectively.

문장표절률: **54%**

The system matrices A, B, C and D have the dimension of 2m x 2m, 2m x 2, m x 2m and m x 2, respectively, and are expressed as = − 2)M−1 (2.1N KN −M−1 N CN 0 1 B = M−1b (2.13) [[ ]]C = −M−1N KN −M−1N CN (2.14) D = M−1N b 0 (2.15) where, 0 and I are m x m zero and unit matrices, respectively, and 0 and −1 are an m x 1 vector of 0 and an m x 1 vector of −1, respectively.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real−time hybrid test method of building structures

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(10). {0(t)} is the mXl vector of the output composed of the absolute acceleratio ns of the numerical substructure. The system matrices A B C and D have the di mension of 2m x 2m 2m x 2, m x 2m and m x 2, respectively, and are expressed as [시 [이麻 {mny[[kni [A네]] (2.12) [B] {0} , {0} [MNYl{b}9 {−1 2.13) C MNT'[KNl −[M(Vr'[Cv]] [D] = [[MNTl{b}9 0 2.14) (2.15) where, 0 and |7| are m x m zero and^init matrices, respectively, and 0 and 1 are an nixl vector of 0 and a n m xl vector of −1, respectively.

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발행 : 서울: 檀國大學校, 2006

(10). (0(/)} is the mxl vector of the output composed of the absolute acceleratio ns of the numerical substructure. The system matrices A], [S], C and D have the dimension of 2m x 2m, 2m x 2, m x 2m and m x 2, respectively, and are express ed as [A] [0L [II (2.12) [B] {0} , {0} [A/v]〉}, {−1 2.13) C MNy[[K, l −[Mj−'tcj [D] = [[MN]−₩b)9 0 2.14) (2.15) where, 0 and I are m x m zero and unit matric es, respectively, and 0 and 1 are an m xl vector of 0 and an m xl vector respecti vely, {b} is an m xl vector given by {1,0, ⋯,0}r.

문장표절률: **44%**

b is an m x 1 vector given by {1, 0, ..., 0}〉. Eq. (2.11) with the inputs of the interf ace force and ground motion is incorporated in the 'Calculating' part shown in F igure 2.1, and produces the absolute acceleration responses of the numerical sub structure on−line.

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{/?} is an m xl vector given by {1, 0,⋯,0}7 Eq. (2 11) with the inputs of the interf ace force and ground motion is incorporated in the 'Calculating' part shown in F ig.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Eq. (2 11) with the inputs of the interface force and ground motion is incorporat ed in the cCalculating' part shown in Fig.

문장표절률: **100%**

Among those acceleration responses, theone corresponding to the top story is ut ilized as the reference signal to operateshaking table.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real−time hybrid test method of building structures

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발행 : 서울 : 단국대학교 대학원, 2007.2

2.2, and produces the absolute acceleration responses of the numerical substruct ure online. Among those acceleration responses, theone corresponding to the to p story is utilized as the reference signal to operateshaking table.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

2.2, and produces the absolute acceleration responses of the numerical substruct ure online. Among those acceleration responses, theone conesponding to the top story is utilized as the reference signal to operateshaking table.

문장표절률: **86%**

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re

2.1.2 Numerical Substructure For the verification experiment of the proposed me thodology, the objectstructure is assumed to be a five-story shear type buildings tructure, of which two upper stories are assumed to be the experimental substruc ture as shown in Fifure 2.15.

문장표절률: **100%**

As a result, the numerical substructure is the three lowerstories of the whole struc ture. For the construction of the finite element model of the numerical substructu re, the inter-story damping and stiffness coefficients of the shear-type experime ntal substructure are identified based on the measured acceleration responses, an d the mass of the two floors are measured directly.

문장표절률: **29%**

Table 2.1: Frequencies observed in the time records of the experimental substruc ture from the test without feedback and the natural frequencies of the assumed whole structure Mode Frequency compo- Natural frequencies nents(Hz) observ ed (Hz) of the whole in the experimental structure with 5 DOFs substructure with 2 DOFs 1 1.3 1.3 2 2.5 4.2 3 4.2 7.1 4 7.1 9.4 5 8.6 10.8 The structural paramete rs for the first story of the experimental struc- ture given in Eq.

문장표절률: **26%**

(2.16) are applied to all stories of the numerical substruc- ture and summarized as the following: 19 Chapter. 2. Hybrid Testing Method i(t) =-mE(1)YE(1)(t)-mE(2)YE(2)(t) (2.17) - + i(t) (2.18) YN(3)(t) =- cN(3) YN(3) - YN(2) N(3) Y N(3) - YN(2) Eq.

문장표절률: **93%**

(2.18) means that the interface force, which is produced by the shak- ing table, i s calculated using the two measured absolute accelerations of the experimental s ubstructure.

문장표절률: **39%**

Then, the interface acceleration is calculated from the numerical substructure ex pressed by Eq. (2.11). Figure 2.6 repre- sents the block diagram of the entire sub structuring testing system including the numerical substructure marked by the sh

aded area.

발행 : 서울 : 단국대학교 대학원, 2007.2

Then, the interface acceleration is calculated from the numerical substructure ex pressed by Eq. (2.11) Fig. 2.11 repre sents the block diagram of entire real-time substructuring experimental system including the numerical · 參 substructure mar ked by the shaded area.

문장표절률: **77%**

In Figure 2.6, the ground acceleration, Ÿg, is not a measured signal but an input data pre- scribed by a user. Finally, the shaking tablemotion is controlled using t he inverse transfer function of Eq.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

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In Fig. 2.11, the ground acceleration, Ÿ{f, is not a measured signal but an input data pre scribed by a user. Finally, the shaking tablemotion is controlled using th e inverse transfer function of Eq.

문장표절률: **62%**

(2.36) to minimize the errors between the interface acceleration computed as the thirdstory absolute acceleration of the numerical substructure, ŸN(3), and the a ctual shaking table accelera- tion.

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(2J7) to minimize the errors between the interface acceleration computed as the t hirdstory absolute acceleration of the numerical substructure, ^V(3), and the act ual shaking table accelera tion.

문장표절률: **40%**

Comparison be- tween the structural responses obtained by the hybrid testing m ethod and the conventional shaking tabletest of a single story steel frame with T LD is made in order to verify the accuracy of the hybrid testing method and the uncontrolled and TLD-controlled structural responses of a three-story struc- t ure are obtained by the hybrid testing method in both time and frequency domai ns.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Comparison be tween the structural responses obtained by the RHSTTM and the conventional shaking tabletest of a single story steel frame with TLD/TLCD is made in order to verify the accuracy of the RHSTTM and the uncontrolled and TLD/TLCD-controlled structural responses of a three story struc ture are obtai ned by the RHSTTM in both time and frequency domains.

문장표절률: **55%**

2.2.1 Hybrid Testing Method with TLD Figure 2.7 depicts the conceptual illustra tions of the hybrid testing method for an n-degrees-of-freedomstructural mod el which is excited by base ac- celeration and has a tuned liquid damper at its to p story.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

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3.1 depicts the conceptual illustrations of the RHSTTM for an n-degrees-of-fre edomstructural model which is excited by base ac celeration and has a tuned liq uid damper at its top story.

문장표절률: **90%**

First, the whole control system is separated into the lower part structure, and the upper part TLD and the interaction force between the structure and TLD are con sid- ered.

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저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

First, the whole control system is separated into the lower part structure, and the upper part TLD and the interaction force between the structure and TLD is consi d ered The TLD with the interacting force at its bottom is physically tested and t he response of the structure withinteracting force at the top floor and the base a cceleration is numerically calculated by using the computer controlling motion o f the shaking table.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

First, the whole control system is separated into the lower part structure, and the upper part TLD and the interaction force between the structure and TLD is consi d ered.

문장표절률: **88%**

The TLD with the interacting force at its bottom is physically tested, and the res ponse of the structure withinteracting force at the top floor and the base acceler ation is numerically calculated by using the computer con- trolling themotion of the shaking table.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

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발행 : 서울 : 단국대학교 대학원, 2007.2

First the whole con trol system is separated into the lower part structure, and the upper part TLD and the interaction force between the structure and TLD is consi dered The TLD with the interacting force at its bottom is physically tested and t he response of the structure withinteracting force at the top floor and the base a cceleration is numerically calculated by using the computer con trolling motion o f the shaking table.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천

발행 : 서울: 檀國大學校, 2006

The TLD with the interacting force at its bottom is physically tested and the response of the structure withinteracting force at the top floor and the base acceleration is numerically calculated by using the computer con trolling motion of the shaking table.

문장표절률: **88%**

Measurement of interacting force is easily accomplished by installing a shear-type load-cell at the bottom of the TLD, as shown in Figure 2.7.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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발행 : 서울 : 단국대학교 대학원, 2007.2

Measurement of interacting force is easily accomplished by installing a shear-type load-cell at the bottom of the TLD, as shown in Fig.

문장표절률: **100%**

TLD-generated shear force is fed back to the control computer. With this fed-back interacting force, the structural response of the story, where a TLD is installed, is calculated using the nu- merical part.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

3.1. TLD-generated shear force is fed back to the control computer. With this fed-back interacting force, the structural response of the story, where a TLD is installed, is calculated using the nu merical part The shaking table excites the upper TLD according to this calculated response.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

3.1. TLD-gcncratcd shear force is fcd back to the control computer. With this fed-back interacting force, the structural response of the story, where a TLD is installed, is calculated using the ^pmerical part.

문장표절률: **45%**

The shaking table excites the upper TLD according to this calculated response. This process is carried out on real-time. The numerical part with n-DOFs, which is subjected to the excitations of the measured control force, ie(t), and the input acceleration, ẍ0(t), at its top and bottom, respectively, as enclosed in dotted line in Figure 2.7, is calculated by MŸi(t) + CẎi(t) + KYi(t) = p(t) (2.19) 21 Chapter.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Concept of the real-time hybrid testing method (TLCD) Of theses procedures the numerical part with n-DOFs, which is subjected to the excitations of the experimentally measured control force, /, (t), and the input acceleration, z0(/), at its top and bottom, respectively, as enclosed in dotted line in Fig.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
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The shaking table excites the upper TLD according to this calculated response. This process is carried out on real-time. Figure 3-1.

문장표절률: **15%**

2. Hybrid Testing Method assessing TLD TLD Experimental Part TLD i(t) Y (t) n m Y (t) n m n n Y (t) Cutting at n-1 m TLD interface Y (t) n-1 n-1 m n-1 sensing Shaking Table i(t) Numerical Part Y (t) Y (t) 1 1 m m 1 1 &z& (t) &z& (t) &z& (t) 0 0 0 shear type load cell &z& (t) &z& (t) 0 0 Figure 2.7: Conceptual view of the hybrid shaking tabletest where, Yi(t) is the absolute displacement at the ith(i = 1→ n) story, and the location vector of external forces with the length of n, p(t) equals to {-ie(t), 0, ..., 0, c1ż0(t) + k1z0(t)}〉, in which subscript "e" denotes the "ex- perimentally" measured interacting force.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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4.1 Js calculated by [M]{^(r)} + [C]{^.(r)} + [^{l:.(r)} = {p(r)} (4.1) where, 예0} is the absolute displacement at the ith(i = l~/i) story, and the location vector of external forces with the length of n p(t) equals to ie(t), 0, c₩z0(t) + k]z0(t)}/ · Also, the structural mass, damping and stiffness matricesare represented by [M] = mn mn −1 , [C] = c −c n − Cn , [K] = ' K −K ' ~kn kn + knA − Vl · · .

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

4.1,is calculated by [A/]{^(0} + [C]{^(0} + [^]{^(0} = {^(0} (4.1) where, is the absolute displacement at the / th(/ = 1 ~ a? story, and the location vector of external forces with the length of n, p(t) equals to {-/·XO, □, ···, □, c, z0(t) + k{z0(t)}r.

문장표절률: **76%**

In this section, the vibration control effect of a TLCD for a buildingstructure ex

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

cited by earthquake load is experimentally evaluated through the hybrid testing method.

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

In this paper, the vibration control effect of a TLCD for a buildingstructure excited by earthquake load is experimentally evaluated through the real-time hybrid shaking tabletesting method (RHSTTM).

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저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

In this paper, the vibration control effect of a TLCD for a buildingstructure excited by earthquake load is experimentally evaluated through the real-time hybrid shaking tabletesting method (RHSTTM).

문장표절률: **77%**

The hybrid testing method does not require a physical buildingstructural model in performing the experiment of a TLCD-structure interactionsystem, and it only uses a TLCD.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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The RHSTTM does n't require a physical buildingstructural model in performing the experiment of a TLCD-structure interactionsystem and it only uses a TLCD.

문장표절률: **100%**

The structural responses of the interactionsystem are calculated numerically in real time using the analytical structural model with the excitations of measured control force, user-defined base earthquake loads, and its statespace realization incorporated in the integrated controller of the shaking table.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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The structural responses of the interactionsystem are calculated numerically in real time using the analytical structural model with the excitations of measured control force, user-defined base earthquake loads, and its statespace realization incorporated in the integrated controller of the shaking table.

문장표절률: **100%**

Also, in order to minimize the distortion of the acceleration of the shaking table, the inverse transfer function of the shaking table is identified, and its statespace realization isimplemented in the shaking table controller.

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Also, in order to minimize the distortion of the acceleration of the shaking table, the inverse transfer function of the shaking table is identified and its statespace realization isimplemented in the shaking table controller.

문장표절률: **37%**

The shaking table behaves as the absolute acceleration of the TLCD mounted floor by calculating the fed back signal of the shear forcesignal measured by the load cell positioned between the TLCD and plate of the shaking table.

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The shaking table reproduces the absolute acceleration of the TLCD installed floor by modulating the feed back gain of the shear forcesignal measured by the load cell positioned between the TLCD and the shaking table.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
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The shaking table reproduces the absolute acceleration of the TLCD installed flo or by modulating the feed back gain of the shear forcesignal measured by the lo ad cell positioned between the TLCD and the shaking table.

문장표절률: **31%**

Comparison results between the structural responses obtained by the hybrid testi ng method and the conventional shaking tabletest of a single story steel frame w ith TLCD are made to verify the accuracy of the hybrid testing method in both ti me and frequency domains.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Comparison between the structural responses obtained by the RHSTTM and the conventional shaking tabletest of a single story steel frame with TLCD is made i n order to verify the accuracy of the RHSTTM in both time and frequency dom ains.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Comparison between the structural responses obtained by the RHSTTM and the conventional shaking tabletest of a single story steel frame with TLCD is made i n order to verify the accuracy of the RHSTTM in both time and frequency dom ains.

문장표절률: **100%**

The whole struc- tural control system, which a TLCD was installed onto the str uctural model with n-degrees-of-freedom at its top story, is separated, and as the result of that, the force interacts at their interface.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

4.2 Real-Time Hybrid Shaking TableTesting Method with TLCD Fig. 1 shows t he conceptual view of the experiment. The whole struc tural control system, whic h a TLCD was installed onto the structural model with n-degrees-of-freedom a t its top story, is separated, and as the result of that, the force interacts at their i nterface.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

4.2 Real-Time Hybrid Shaking TableTesting Method with TLCD Fig. 1 shows t he conceptual view of the experiment. The whole struc tural control system, whic h a TLCD was installed onto the structural model with n-degrees-of-freedom a t its top story, is separated, and as the result of that, the force interacts at their i nterface.

문장표절률: **98%**

The upper part of TLCD with the interacting force at its bottom is physically test ed and the lower part of the structural model with the interacting force and the i nput motion at its top story and base, respectively, is numerically calculated with in the computer to control themotion of shaking table.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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문장표절률: **100%**

For the experimental implementa- tion, interacting or control force generated by a TLCD, which is observed from a load-cell, is fed back to the control comput er.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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문장표절률: **100%**

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With the fed-back interacting force, the structural response of the story, where a TLCD is in- corporated, is calculated from the numerical part.

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With the fed-back interacting force, the structural response of the story, where a TLCD is in corporated, is calculated from the numerical part.

문장표절률: **14%**

The shaking table excites the upper TLCD with this calculated response. These processes are carried out on real-time. 5VOFE -JRVJE $PMVNO %BNQFS i & BTTFTTJOH1YBQSUFSJNFOUBM TFOTJOH 4IBLJOH 5BCMF t) Yn(t) Yn(t) mn mn i(t) Yn□1(t) n□1 5-$$V%UU JJOOUHF BSGUB DF Yn□1(t) mn□1 1/BVSNU FSJDBM TIFBS UZQF MPBE DFMM Y1(t) Y1(t) m1 m1 z0(t) z0(t) z0(t) z0(t) z0(t) Figure 2.8: Concept of the hybrid testing method (TLCD) Of theses procedures, the numerical part with n-DOFs, which is sub- jected to the excitations of the experimentally measured control force, ie(t), and the input acceleration, ẍ0(t), at its top and bottom, respectively, as enclosed in dotted line in Figure 2.8, is calculated by MYi(t) + CYi(t) + KYi(t) = p(t) (2.26) where, Yi(t) is the absolute displacement at the ith(i = 1→ n) story, and the location vector of external forces with the length of n, p(t) equals to {-ie(t), 0, ..., 0, c1ẋ0(t) + k1z0(t)}〉, in which subscript "e" denotes the "ex- perimentally" measured interacting force.

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Concept of the real-time hybrid testing method (TLCD) Of theses procedures, the numerical part with n-DOF$, which is sub jected to the excitations of the experimentally measured control force, ij), and the input acceleration, z()(0, at its top and bottom, respectively, as enclosed in dotted line in Fig.

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Concept of the real-time hybrid testing method (TLCD) Of theses procedures, the numerical part with n-DOFs, which is sub jected to the excitations of the experimentally measured control force, /, (t), and the input acceleration, z0(/), at its top and bottom, respectively, as enclosed in dotted line in Fig.

문장표절률: **76%**

The shaking tableshown in Figure 2.11 moves in accordance with the con- trol signal, which is generated by the control computer and sent through D/A conversion board.

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2.6. The shaking tableshown in Fig. 2.6 moves in accordance with the con trol signal, which is generated by the control computer and sent through D/A conversion board.

문장표절률: **59%**

In almost every case, the target acceleration signal and actual acceleration produced by the shaking table are different in their amplitudes and phases due to the shaking table dynamics.

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In almost every case, the target acceleration signal and actual acceleration generated by the shaking table are different in their amplitudes and phases due to the shaking table dynamics.

문장표절률: **94%**

Therefore, in order to compensate the distortion of the actual shaking table acceleration against the shaking table dynamics existing between the reference signal and the actual measured acceleration of the shaking table, the inverse transfer function of the actual acceleration of shaking table with respect to the com- mand signal generated by the control computer is constructed and imple- mented in the shaking table control computer as shown in Figure 2.15.

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문장표절률: **57%**

First, the inverse transfer function, of which amplitude and phase are represented in Figure 2.12 by the dashed line, is obtained experimentally.

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2.8. First, the inverse transfer function, of which amplitude and phase are represented in Fig. 2.7 by the dashed line, is obtained experimentally.

문장표절률: **100%**

Then, the ex- perimental inverse transfer function is approximated by a rational function for its implementation in the control computer.

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Then, the ex perimental inverse transfer function is approximated by a rational function for its implementation in the control computer.

문장표절률: **60%**

First, the shaking tabletest without feedback loop of ac- celerations measured fr om the experimental substructure into the shaking table controller in Figure 2.6 is performed to confirm the validity of the proposed method experimentally.

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[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures
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First, the shaking tabletest without feedback loop of ac celerations measured fro m the experimental substructure into the shaking tabic controller in Fig.

문장표절률: **100%**

In this case, the thirdstory acceleration of responses pre-calculated from the ass umed whole building with structural parameters such as Eqs.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계
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2.11 is performed to experimentally confirm the validity of the proposed method. In this case, the thirdstory acceleration of responses pre-calculated from the ass umed whole building with structural parameters such as Eqs.

문장표절률: **59%**

(2.16) and (2.17) is used as a reference signal in Figure 2.15. Figure 2.25 compar es the time histories and Fourier transform of the acceleration responses, which are measured from the experimental substructure and shaking table, with those c alculated from the numerical analysis of the whole assumed structure.

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(2.18) and (2.19) is used as a reference signal in Fig. 2.8. Fig. 2.12 compares the time histories and Fourier transform of the acceleration responses, which are me asured from the experimental substructure and shaking table, with those calculat ed from the numerical analysis of the assumed whole structure.

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문장표절률: **62%**

In other words, the responses cor- responding to the 3rd, 4th and 5th story acc elerations are compared. Also, Figures 2.26-2.28 showing the variation of frequ ency components according to time lapse illustrate the spectrogram and contour plots of experimental and numerical accelerations of the 3rd, 4th and 5th story, respectively.

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문장표절률: **55%**

As can be confirmed from Figure 2.25, the experimental accelerations obtained f rom the shaking tabletest without their feedback agree well with those obtained f rom the analysis of the whole assumed structure in both time and frequency do mains.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계
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As can be confirmed from Fig. 2.12, the experimental accelerations obtained fro m the shaking tabletest without their feedback agree well with those obtained fro m the analysis of the assumed whole structure in both time and frequency domai ns.

문장표절률: **46%**

However, it can be observed that the small discrepancies are shown in the time h istories of 4th and 5th story accelerations as shown from Figure 2.25, while the 3rd story acceleration is identical to the numer- ical one over the entire time hist ory as known from Figures 2.25-2.26.

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However, it can be observed that the small discrepancies are shown in the time h istories of 4th and 5th story accelerations as shown from Fig.

문장표절률: **63%**

These differences are caused by the inherent modes of experimental substructure ; the frequency components of 2.5 and 8.6 Hz corresponding to the firstandsec ond modes of the experimental substructure, respectively, are observed in the me asured acceleration of 4th story as known from Figure 2.27, and also the comp onent of 2.5 Hz is expressed in the 5th story experimental accel- eration as like Figure 2.28.

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These differences are caused by the inherent modes of e^erimental substructure; the frequency components of 2.5 and 8.6 Hz corresponding to the firstandseco nd modes of the experimental substructure, respectively, are observed in the mea sured acceleration of 4th story as known fiom Fig.

문장표절률: **54%**

It is considered that this tendency is especially conspicuous in the case of utilizin g a lightly-damped testing model as an ex- perimental substructure.

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2.14, and also the component of 2.5 Hz is expressed in the 5th story ex periment al acceleration as like Fig. 2.15. It is considered that this tendency is especially c onspicuous in case of utilizing a lightly-damped testing model as an ex periment al substructure.

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2.14, and also the component of 2.5 Hz is expressed in the 5th story ex periment al acceleration as like Fig. 2.15. It is considered that this tendency is especially c onspicuous in case of utilizing a lightly-damped testing model as an ex periment al substructure.

문장표절률: **83%**

Table 1 shows the frequency components observed in the time records of an exp erimental substructure from the test without its acceleration feedback and the nat ural frequencies calculated from the whole assumed structure with five stories.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Table 1 shows the frequency components observed in the time records of an exp erimental substructure from the test without its acceleration feedback and the nat ural frequencies calculated from the assumed whole structure with five stories.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Table 1 shows the frequency components observed in the time records of an exp erimental substructure from the lest without its acceleration feedback and the nat ural frequencies calculated from the assumed whole structure with five stories.

문장표절률: **100%**

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시

From Table 2.1, it can be noted that the first natural frequency of the experimental substructure is shifted from 2.5 Hz to 1.3 Hz by the dynamics of the three-story numerical substructure added to its base.

스템 설계
저자 : 박은천
발행 : 서울: 檀國大學校, 2006

From Table 2.1, it can be noted that the first natural frequency of the experimental substructure is shifted from 2.5 Hz to 1.3 Hz by the dynamics of the three-story numerical substructure added to its base.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

From Table 2.1, it can be noted that the first natural frequency of the experimental substructure is shifted from 2.5 Hz to 1.3 Hz by the dynamics of the three-story numerical substructure added to its base.

문장표절률: **59%**

Then, the substructuring testing expressed as Figure 2.6 was carried out based on the acceleration feedback of the experimental sub- structure.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Then, the real-time substructuring shaking tabletest expressed as Fig. 2.11 was carried out based on the acceleration feedback of the experimental sub structure.

문장표절률: **30%**

2. Hybrid Testing Method culated from the numerical analysis of the whole assumed structure with 5 DOFs. Also, Figures 2.30-2.32 express the frequency components according to time lapse, which is observed in the measured responses from the test with feedback and the calculated ones of the 3rd, fourth and fifth story, re- spectively.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Fig. 16 compares the responses measured from the test with the acceleration feedback of the experimental substructure with those calculated from the numerical analysis of the assumed whole structure with 5 DOFs Also, Figs, 2.17~2.19 express the frequency components according to time lapse, which are observed in the measured responses from the test with feedback and the calculated ones of the 3rd,4th and 5th story, re spectively.

문장표절률: **59%**

As known from Figure 2.29, the inclination in entire time history responses measured from the proposed testing method agrees well with that calculated from the whole assumed structure.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

As known from Fig. 2.16, the inclination in entire time history responses measured from the proposed testing method agrees well with that 25 2.

문장표절률: **44%**

These are why the first mode responses of substructured system coincide well with those of the whole supposed system over the entire time range, as shown in Figures 2.30-2.32.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

REAL-TIME SUBSTRUCTURING TECHNIQUE calculated from the assumed whole structure. This is why the first mode responses of substructured system coincide well with those of the assumed whole system over the entire time range, as shown in Figs.

문장표절률: **53%**

However, as can be confirmed from Figures 2.30-2.32, instead of the second and third mode responses of the substructured system, those of the experi- mental substructure are observed from the testing results in the vicinity of 2.5 and 8.6 Hz.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

2.17-2.19. However, as can be confirmed from Figs. 2.17-2.19, instead of the 2nd and 3rd mode responses of substructured system, those of the experi mental substructure are observed from the testing results in the vicinity of 2.5 and 8.6 Hz.

문장표절률: **74%**

It is considered that in the process of the acceleration feed- back of the experimental substructure, its fundamental modes affect to the numerical substructure and then the numerical error occurs in calculating the numerical substructure.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

It is considered that in the process of the acceleration feed back of the experimental substructure, its fundamental modes affect to the numerical substructure and then numerical error occurs in calculating the numerical substructure.

인용포함 문장 문장표절률: **38%**

41 Chapter. 2. Hybrid Testing Method &"YOQBFMZSTJNJTFOU 5JNF TFD (a) Time domain N T UI PPS &"YOQBFMZSTJNJTFOU 'SFRVF ODZ)[(b) Frequency domain Figure 2.25: Comparisons of results measured from the experiment without feedback and those calculated from numerical analysis.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
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Comparisons of results measured from the experiment without FEEDBACK AND THOSE CALCULATED FROM NUMERICAL ANALYSIS.....27 Figure 2-13.

문장표절률: **89%**

As a result, the mass ratio of the TLD to the structure is about 1.3%. To confirm whether the numerically calculated fre- quency of the TLD is modulated to the structural one, the transfer function is shown in Figure 2.34, from the shaking table acceleration to the shear force by the TLD, was obtained by using the white noise excitation.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

As a result, the mass ratio of the TLD to the structure is about 1.3 To confirm whether the numerically calculated fre quency of the TLD is modulated to the structural one, the transfer fimction shown in Fig.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

3.5, from the shaking table acceleration to the shear force by the TLD, was obtained by using the white noise excitation. It is observed in Fig.

문장표절률: **75%**

It is observed in Figure 2.34 that the TLD has the sloshing frequency of 1.25Hz which is very closeto the structural natural frequency of 1.23Hz.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

3.5 that the TLD has the sloshing frequency of 1.25Hz which is very closeto the structural natural frequency of 1.23Hz. 43 4. RHSTTM for the Performance Evaluation of a Timed Liquid Column Damper 병자 · · 4 m r (a) Conventional shaking tabletest (b) Real-time hybrid shaking tabletest Figure 3-4.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

3.5 that the TLD has the sloshing frequency of 1.25Hz which is very closeto the structural natural frequency of 1.23Hz. 43 4. RHSTTM for the Performance Evaluation of a Tuned Liquid Column Damper (a) Conventional shaking tabletest (b) Real-time hybrid shaking tabletest Figure 3-4.

문장표절률: **52%**

At first, the conventional shaking tabletest is shown in Figure 2.33(a) is performed to investigate the seismic response control performance of the TLD.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

3.4 (a) is performed to investigate the seismic response control performance of the TLD. Previously mentioned four earthquake records are scaled to have the peak acceleration of 100 gal and used to excite the TLD-structuresystem.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

3.4 (a) is performed to investigate the seismic response control performance of the TLD- Previously mentioned four earthquake records are scaled to have the peak acceleration of 100 gal and used to excite the TLD-structuresystem.

문장표절률: **64%**

Previously mentioned four earthquake records are scaled to have the peak acceleration of 100 gals and used to excite the TLD-structuresystem.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

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[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

3.4 (a) is performed to investigate the seismic response control performance of the TLD- Previously mentioned four earthquake records are scaled to have the peak acceleration of 100 gal and used to excite the TLD-structuresystem.

문장표절률: **68%**

Figures 2.35 and 2.36 show the measured structural acceleration responses in the time and frequency domains, respectively.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Figs. 3.6 and 3.7 show the measured structural acceleration responses in the time and frequency domains, respectively. It is observed from Fig.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Figs. 3.6 and 3/7 show the measured structural acceleration responses in the time and frequency domains, respectively. It is observed from Fig.

문장표절률: **62%**

2. Hybrid Testing Method 2.6.3 Hybrid Testing Method of Three Story Structure with a TLD The control performance of a TLD installed in a three-story structure is investigated by using the hybrid testing method.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

RHSTTM for the Performance Evaluation of a Timed Liquid Column Damper 3.4.2 A Three Story Structure with a TLD The control performance of a TLD installed in a three story structure is investigated by using the RHSTTM.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

RHSTTM for the Performance Evaluation of a Tuned Liquid Column Damper 3.4.2 A Three Story Structure with a TLD The control performance of a TLD installed in a three story structure is investigated by using the RHSTTM.

문장표절률: **54%**

The structure is assumed to be a three story shear-type model, which has identical story properties as follows; mi = 128.8kg, ci = 13.52N ·s/m, ki = 33908N/m for i = 1, 2, 3.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

The structure is assumed to be a three story shear-type model, which has identical story properties as follows; W/= 128.8kg, c, = 13.52N s/m? 33908N/m for z=l, 2, 3.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

The structure is assumed to be a three story shear-type model, which has identical story properties as follows; m/= 128.8kg, c;= 13.52N s/m, 오/= 33908N/m for 1, 2, 3.

문장표절률: **76%**

The structure has natural frequencies of 1.15Hz, 3.22Hz and 4.65Hz. The TLD discussed in the previous section is used, and its water level is modulated to 4.6 cm for the TLD to have sloshing frequency of 1.15Hz.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

The structure has natural frequencies of 1.15Hz, 3.22Hz and 4.65Hz. The TLD discussed in the previous section is used and its water level is modulated to 4.6cm in order for the TLD to have sloshing frequency of 1.15Hz.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

The structure has natural frequencies of L15Hz, 3 22Hz and 4.65Hz. The TLD discussed in the previous section is used and its water level is modulated to 4.6cm in order for the TLD to have sloshing frequency of 1.15Hz.

문장표절률: **100%**

As a result, the mass ratio of the TLD to the structure is about 2%. The four earthquake waves used for the excitation of the single story steel frame were scaled to have peak acceleration of 40gal.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

As a result, the mass ratio of the TLD to the structure is about 2 The four earthquake waves used for the excitation of the single story steel frame were scaled to have peak acceleration of 40gal.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

As a result, the mass ratio of the TLD to the structure is about 2 The four earthquake waves used for the excitation of the single story steel frame were scaled to have peak acceleration of 40gal.

문장표절률: **100%**

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

The uncontrolled structural responses were obtained by removing the feedback l oop of the TLD-generated interacting force, which causes the numerical structu ral model to be excited only by the base earthquake motion.

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발행 : 서울: 檀國大學校, 2006

The uncontrolled structural responses were obtained by removing the feedback l oop of the TLD-generated interacting force, which causes the numerical structu ral model to be excited only by the base earthquake motion.

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저자 : 박은천
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The uncontrolled structural responses were obtained by removing the feedback l oop of the TLD-generated interacting force, which causes the numerical structu ral model to be excited only by the base earthquake motion.

문장표절률: **72%**

Figures 2.39 and 2.40 compare the uncontrolled and controlled accelerations of the thirdstory in time and frequency domains, respectively, which is realized by t he shaking tablethrough the hybrid testing method.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Figs. 3.10 and 3.11 compare the uncontrolled and controlled accelerations of th e thirdstory in time and frequency domains, respectively, which is realized by the shaking tablethrough the RHSTTM.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

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Figs. 3.10 and 3.11 compare the uncontrolled and controlled accelerations of th e thirdstory in time and frequency domains, respectively, which is realized by the shaking tablethrough the RHSTTM.

문장표절률: **100%**

It is observed that the structural accelerations aresignificantly reduced by the TL D, especially in the region of the fundamental frequency.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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It is observed that the structural accelerations aresignificantly reduced by the TL D, especially in the region of the fundamental frequency.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

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발행 : 서울 : 단국대학교 대학원, 2007.2

It is observed that the structural accelerations aresignificantly reduced by the TL D, especially in the region of the fundamental frequency.

문장표절률: **69%**

2. Hybrid Testing Method tified structural parameters are reflected in the numeri cal part expressed by the shaded region in the integrated controllershown in Figu re 2.19.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

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3.4 (b). For its implementation for the controlled case, the identified structural pa rameters are reflected in the numerical part expressed by the shaded region in the integrated controllershown in Fig.

문장표절률: **78%**

The con- tinuous filters in the figure are converted into discrete ones with a time step of 0.01 sec in the actual implementation of the experiment.

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RHSTTM for the Performance Evaluation of a Tuned Liquid Column Damper i n Fig. 4.3. The con tinuous filters in the figure are converted into discrete ones w ith a time step of 0.01 sec in actual implementation of the experiment.

문장표절률: **50%**

Figure 2.42 com- pare the controlled accelerations experimentally measured by i mplementing the conventional and the hybrid testing method in both time and fre quency domain, respectively.

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Fig. 4.5 com pare the controlled accelerations experimentally measured by imple menting the conventional and the real-time hybrid shaking tabletests in both time and frequency domain, respectively.

문장표절률: **77%**

The validity of the hybrid testing method performed in this paper is verified from the fact that the experimental results from two methods well coincide with each

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other on the whole.

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The validity of the real-time hybrid shaking tabletest performed in this paper is verified from the fact that the experimental results from two methods well coincide with each other on the whole.

문장표절률: **20%**

BDD H UJNF T FD (a) El Centro Earthquake(time domain) BDD H UJNF T FD (c) Kobe Earthquake(time domain) H TFD ' SFR VFO D Z) [(b) El Centro Earthquake(frequency do- main) H TFD ' SFR VFO D Z) [(d) Kobe Earthquake(frequency domain) Figure 2.42: Comparisons between the results from the conventional testing method(dotted line) and those from the hybrid testing method(solid line) for the controlled response 60 Chapter.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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Comparisons between the results from the conventional testing method(dotted line) and those from the RHSTTM(solid line) for the controlled response 61 4.

문장표절률: **83%**

Figures 2.53 and 2.54 show the displacement and acceleration response in the frequency domain, respectively. It is observed that the displacement response of the shaking table was reduced by 78% for the case in the TMD control direction.

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발행 : 서울 : 단국대학교 대학원, 2008

Fig.4.17 shows the displacement and acceleration response in the frequency domain, respectively. It is observed that the displacement response of the shaking table was reduced by 78 for the case in the TMD control direction.

문장표절률: **40%**

The displacement control performance index of a TMD is 0.22, as shown in Figure 2.53. Also, the acceleration response of the shaking table was reduced by 78 %, as shown in Figure 2.54.

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So, The displacement control performance index of a TMD is 0.22, as shown in Fig.4.17(a). Also, the acceleration response of the shaking table was reduced by 78 %.

문장표절률: **59%**

Figure 2.55 shows the displacement in the time domain. The response of the shaking table is considerably reduced by 78% at a resonance frequency of 0.82 Hz.

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Displacement and acceleration in the time domain by the real-time hybrid test (TMD direction, 0.83Hz) Fig.4.18 shows the displacement and acceleration response in the time domain, respectively, the response of the shaking table is considerably reduced by 78% at a resonance frequency of 0.83 Hz.

문장표절률: **45%**

Then, the test was performed in the TLCD control direction. Figures 2.56 and 2.57 show the displacement and acceleration response of the shaking table in the frequency domain, respectively.

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Fig.4.19 shows the displacement and acceleration response of the shaking table in the frequency domain, respectively. It is observed that the displacement response was reduced by 71 % for the case in the TLCD control direction, and the acceleration response reduced by 70 %.

문장표절률: **100%**

It is observed that the displace- ment response was reduced by 71% for the case in the TLCD control direc- tion, and the acceleration response reduced by 70%.

[Copykiller] Design of a Bi-directional Tuned Liquid Mass Damper for Controlling Dynamic Responses of Building Structures : 건축구조물의 동적응답제어를 위한 2방향 동조액체질량감쇠기 설계

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Fig.4.19 shows the displace ment and acceleration response of the shaking table in the frequency domain respectively. It is observed that the displace ment response was reduced by 71 for the case in the TLCD control direc tion, and the acceleration response reduced by 70 %.

문장표절률: **21%**

Also, the displacement and acceleration response of the shaking table are considerably reduced at 64 Chapter. 2. Hybrid Testing Method VDPOODUPSOPUMSPM 'SFRVF O DZ)[Figure 2.48: Acceleration in the frequency domain (TMD direction) V DP OODPUSOPUMSPM 5JN F T Figure 2.49: Displacement in the time domain (TMD direction, 0.82 Hz) a resonance frequency of 0.73 Hz, respectively, as shown in Figure 2.58.

[Copykiller] Design of a Bi-directional Tuned Liquid Mass Damper for Controlling Dynamic Responses of Building Structures : 건축구조물의 동적응답제어를 위한 2방향 동조액체질량감쇠기 설계

저자 : 허재성
발행 : 서울 : 단국대학교 대학원, 2008

Time (s) Time (s) Figure 4-20. Displacement and acceleration in the time domain by the real-time hybrid test (TLCD direction, 0.73 Hz) Also, the displacement and acceleration response of the shaking table are considerably reduced at a resonance frequency of 0.73 Hz, respectively.

문장표절률: **58%**

The lower part of the whole structure or whole buildingstructure is modeled numerically. In or- der to verify the validity and accuracy of the proposed technique, a shaking tabletest was conducted.

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저자 : 박은천
발행 : 서울: 檀國大學校, 2006

In or der to verify the validity and accuracy of the proposed technique, a shaking tabletest was conducted. The result of the study can be summarized as follows

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In or der to verify the validity and accuracy of the proposed technique, a shaking tabletest was conducted. The result of the study can be summarized as follows.

문장표절률: **75%**

The result of the study can be summarized as follows. 1. To reduce the distortion of the interface acceleration, the inverse trans- fer function of the shaking table was identified, and its statespace realization wasimplemented in the shaking table controller.

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저자 : 박은천
발행 : 서울: 檀國大學校, 2006

(1 To reduce the distortion of the interface acceleration, the inverse trans fer function of the shaking table was identified and its statespace realization wasimplemented in the shaking table controller.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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(1 To reduce the distortion of the interface acceleration, the inverse trans fer function of the shaking table was identified and its statespace realization wasimplemented in the shaking table controller.

문장표절률: **100%**

2. In this paper, the linear transfer function approach for controlling themotion of a shaking table was considered to experimentally verify the proposed method for a linear experimental part.

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(2 In this paper, the linear transfer function approach for controlling themotion of a shaking table was considered to experimentally verify the proposed method for a linear experimental part.

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발행 : 서울: 檀國大學校, 2006

The result of the study can be summarized as follows. (1) The linear transfer function approach for controlling themotion of a shaking table was considered to experimentally verify the proposed method for a linear experimental part.

문장표절률: **58%**

However, this ap- proach would be inappropriate in a coupled non-linear system leading to experimental instability. Therefore, in such case, the controller us- ing the inverse transfer function of shaking table, shown in Figure 2.6, would be modified to compensate an experimental instability.

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However, this ap proach would be inappropriate for a coupled non-linear system leading to experimental instability. Therefore, in such case the controller using the inverse transfer function of shaking table, shown in Fig.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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However, this ap proach would be inappropriate for a coupled non-linear system leading to experimental instability. Therefore, in such case the controller using the inverse transfer function of shaking table, shown in Fig.

문장표절률: **95%**

3. The interface force between the experimental and numerical substruc- tures was obtained using only acceleration measurement and mass in- formation so that high-capacity loads cell and installation jigs are not required in the substructuring technique.

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11,would be modified to compensate an experimental instability. (3 The interface force between the experimental and numerical substruc tures was obtained using only acceleration measurement and mass in formation so that high-capacity loads cell and installation jigs are not required in the experiment.

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11,would be modified to compensate an experimental instability. (3 The interface force between the experimental and numerical substruc tures was obtained using only acceleration measurement and mass in formation so that liigh-capacity loa

ds cell and installation jigs are not required in the experiment.

문장표절률: **73%**

4. The proposed method basing the interface force measurement on accel- erati on measurements from an experimental substructure is partially available only wh en the mass distribution is discrete - for example, this technique would be applic able to the TMD as an experimental part.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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(4 The proposed method basing the interface force measurement on accel eratio n measurements from an experimental substructure is partially available only whe n the mass distribution is discrete - for example this would be applicable to the T MD as an experimental part.

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(4 The proposed method basing the interface force measurement on accel eratio n measurements fiom an experimental substructure is partially available only whe n the mass distribution is discrete - for example this would be applicable to the T MD as an experimental part.

문장표절률: **100%**

Also, the interface force measurement using force transducers is required to perf orm the proposed method when wind forces are applied to the experimental subs tructure.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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Also, the interface force measurement using force transducers is required to perf orm the proposed method when wind forces are applied to the experimental subs tructure.

문장표절률: **94%**

6. An unexpected vibration of the experimental substructure can be induced by th e feedback of responses including its inherent natural modes and then by the err or occurred in calculating the numerical substructure.

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(6) Unexpected vibration of the experimental substructure can be induced by the feedback of responses including its inherent natural modes and then by the error occurred in calculating the numerical substructure.

문장표절률: **56%**

72 Chapter. 2. Hybrid Testing Method 7. It is considered that to minimize the eff ect of natural modes of an experimental substructure on the substructured syste m, the structural model as heavily-damped as possible would be used as an exp erimental part.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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(2) It is considered that to minimize the effect of natural modes of an experiment al substructure on the substructured system, the structural model as havily-dam ped as possible would be used as an experimental part.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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(2) It is considered that to minimize the effect of natural modes of an experiment al substructure on the substructured system, the structural model as havily-dam ped as possible would be used as an experimental part.

문장표절률: **73%**

8. The proposed technique can be extended to the substructuring tech- nique wit h themiddle part of a whole structure in combination with the conventional subst ructuring technique employing lower part as the experimental substructure.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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REAL-TIME SUBSTRUCTURING TECHNIQUE possible would be used as an experimental part. (8 The proposed technique can be extended to the real-time s

ubstructuring tech nique with themiddle part of a whole structure in combination with the conventional substructuring technique employing lower part as the experimental substructure.

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발행 : 서울: 檀國大學校, 2006

REAL-TIME SUB STRUCTURING TECHNIQUE possible would be used as an experimental part. (8 The proposed technique can be extended to the real-time substriictiuing tech nique with themiddle part of a whole structure in combination with the conventional substmctiuiiig technique employing lower part as the experimental substructure.

문장표절률: **82%**

9. The TLD installed on the top floor of the structure is physically tested, and simultaneously numerical calculation is carried out for the as- sumed analytical structural model.

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The TLD installed at the top floor of the structure is physically tested, and simultaneously numerical calculation is carried out for the as sumed analytical structural model.

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The TLCD installed at the top floor of the structure is physically tested, and simultaneously numerical calculation is carried out for the as sumed analytical structural model.

문장표절률: **26%**

10. Comparison between the structural responses obtained by the hybrid testing method and the conventional shaking tabletest of a single story steel frame with TLD and TLCD indicates that the performance of the TLD and TLCD can be accurately evaluated using the hybrid testing method without the physical structural model.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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발행 : 서울: 檀國大學校, 2006

Comparison between the structural responses obtained by the RHSTTM and the conventional shaking tabletest of a single story steel frame with TLD/TLCD indicates that the performance of the TLD/TLCD can be accurately evaluated using the RHSTTM without the physical structural model.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Comparison between the structural responses obtained by the RHSTTM and the conventional shaking tabletest of a single story steel frame with TLD/TLCD indicates that the performance of the TLD/TLCD can be accurately evaluated using the RHSTTM without the physical structural model.

문장표절률: **88%**

11. The uncontrolled and TLD-controlled structural responses of a three- story structure are obtained by the hybrid testing method in both time and frequency domains, showing that TLD can effectively mitigate the seismic responses of buildingstructures and the hybrid testing method can reproduce the dynamic behavior of TLD-structure interactionsys- tems for both the uncontrolled and controlled case.

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저자 : 박은천
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Finally the uncontrolled and TLD-controlled structural responses of a three story structure are obtained by the RHSTTM in both time and frequency domains, showing that TLD can effectively mitigate the seismic responses of buildingstructures and the RHSTTM can reproduce the dynamic behavior of TLD-structure interactionsys tems for both the uncontrolled and controlled case.

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저자 : 박은천
발행 : 서울: 檀國大學校, 2006

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문장표절률: **91%**

Figure 3.2(a) shows the shape of the band-stop filter In discrete Fourier transform dealing with the finite duration discrete signal as an infinite one multiplied by a rectangular window, the originalsignal in time domain is distorted especially in initial and final time in- tervals.

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문장표절률: **59%**

This distortion can be reduced by using an envelope functionsuch that the given deterministic wind load has ascending and descending time intervals.

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This distortion can be reduced by using an envelop functionsuch that the given deterministic wind load has ascending and descending time intervals.

문장표절률: **98%**

Although the envelope function changes the deterministic wind load, the effect of this another distortion would be trivial in evaluating the characteristics of wind load induced response because the grave concern is generally in the intermediate time of the total loading duration when the peak response is expected to occur.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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Although the envelope function changes the deterministic wind load, the effect of this another distortion would be trivial in evaluating the characteristics of wind load induced response because grave concern is generally in the intermediate time of the total loading duration when the peak response is expected to occur.

문장표절률: **55%**

Figure 3.2(b) shows the shape of the envelope function used in this study. 3.1.2 Numerical Example 76 story wind-induced benchmark buildings The wind-induced responsesimulating actuator is applied to a 76-story 306 meters office tower benchmark building which is slender with a height to width ratio of 306.1/42 = 7.3.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

DESIGN OF AN ACTUATOR FOR SIMULATING WIND RESPONSE The wind-induced responsesimulating actuator is applied to a 76-story 306 meters office tower benchmark building which is slender with a height to width ratio of 306.1/42 = 7.3.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
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DESIGN OF AN ACTUATOR FOR SIMULATING WIND RESPONSE The wind-induced responsesimulating actuator is applied to a 76-story 306 meters office tower benchmark building which is slender with a height to width ratio of 306.1/42 = 7.3.

문장표절률: **25%**

Because the deterministic across-wind load 77 Chapter. 3. Design of Excitation System for Simulating Dynamic Loads &OWFMPQ GVODUJPO 'SF RVFODZ) [t1 5JNF TFDPOE t2 (a) The shape of the band-stop filter (b) The shape of the envelop function Figure 3.2: Exciter gain shape of the band-stop filter and the envelop func- tion.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

0 1 c UJ t Time (second) i (b) The shape of the envelop function Figure 5-2 Exciter gain shape of the band-stop filter and the envelop func tion 66 5.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Scheme of simulation of wind induced responses using LMS and ATMD ....64 Figure 5-2 Exciter gain shape of the band-stop filter and the envelop func tion.

문장표절률: **57%**

data is given through wind tunnel tests for this benchmark building, the force of the actuator realizes target across-wind induced structural response can be calculated using Eq.

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저자 : 박은천
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Because the deterministic across-wind load data is given through wind tunnel tests for this benchmark building, the force of the actuator force realizing target across-wind induced structural resp이lse can be calculated using Eq.(4).

문장표절률: **92%**

(3.4). In order to reduce numerical computation time, a 23 degree of freedom (DOF) state reduced-ordersystem model proposed by Yang et al.

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스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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발행 : 서울 : 단국대학교 대학원, 2007.2

In order to reduce numerical computation time, a 23 degree of freedom (DOF) state rcduccd-ordcrsystem model proposed by Yang ct al.

문장표절률: **97%**

(2004b). is used in this study. The wind load vector is modeled physically by lumping wind forces on adjacent floors at the locations that correspond to the 23 DOF model.

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문장표절률: **73%**

Figures 3.3(a), 3.3(b) shows the plan view and elevation view of the 76th benchmark building and Figures 3.3(c), 3.3(d) show the mode shape of first three mode of the structure and time history of wind-load.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

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저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

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문장표절률: **92%**

3.1.3 Error evaluation criteria In order to verify the effectiveness of proposed method through the compar- ison between the wind and actuator induced structural responses, two error criteria are considered in time and frequency domains, respectively.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

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저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

5A.2 Error evaluation criteria In order to verify the effectiveness of proposed method through the compar ison between the wind and actuator induced structural responses, two error criteria are considered in time and frequency domains, respectively.

문장표절률: **39%**

Figure 3.4: Transfer function of 75th story responses to LMS. Figure 3.5 shows the frequency response function and the time history of the actuator force obtained without using a filter when the target response is acceleration or displacement of the 75th floor.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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Transfer function of 75th story responses to LMS Fig. 5.5 shows the frequency response function and the time history of the actuator force obtained without using filter when the target response is acceleration or displacement of 75th floor.

문장표절률: **51%**

It is known from Figure 3.5 that much larger force are required for the shaker to achieve the target displacement than acceleration response, and furthermore there exist high- frequency components in Figure 3.4(b), which result in high-speed switching of control force as shown in Figure 3.5(b).

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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문장표절률: **85%**

In practice, hydraulic actuators popular in civil engineering structures is not suita ble for this undesirable chattering problem which causes spillover instability in hi gher modes, and acceleration response concerned with service ability criteria is more critical for such high-rise building excited by wind load as this benchmark building]5' T]]5' T] 80 Chapter.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

5.4(d), which result in high speed-switching of control force as shown in Fig. 5. 4(e). In practice, hydraulic actuators popular in civil engineering structures is not suitable for this undesirable chattering problem which causespillover instability in higher modes, and acceleration response concerned with service ability criteria is more critical for such high-rise building excited by wind load as this benchmark building than displacement.

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문장표절률: **67%**

3. Design of Excitation System for Simulating Dynamic Loads than displacemen t. Figure 3.6 shows the comparison between the frequency responses of wind an d LMS induced 75th-floor acceleration and displace- ment when the target resp onse is 75th displacement.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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발행 : 서울: 檀國大學校, 2006

Fig. 5.6 shows the comparison between the frequency responses of wind and L MS induced 75th floor acceleration and displace ment when the target response i s 75th displacement.

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Fig. 5.6 shows the comparison between the frequency responses of wind and L MS induced 75th floor acceleration and displace ment when the target response i s 75th displacement.

문장표절률: **73%**

It is obviously shown that the wind and LMD induced displacement coincide wel l with each other while acceleration responses are very different.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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It is obviously shown that wind and LMD induced displacement coincide well wi th each other while acceleration responses are very different.

문장표절률: **71%**

Based upon the observation in Figure 3.5 and 3.6, only acceleration response is considered as target re- sponse for calculating LMD force reproducing wind in duced displacement as well as acceleration in this study.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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Based upon the observation in Fig. 5.5 and Fig. 5.6, only acceleration response i s considered as target re sponse for calculating LMD force reproducing wind in duced displacement as well as acceleration in this study.

문장표절률: **43%**

Table 3.1: Cutoff frequency for filter design Target response ω1 (rad/sec) ω2 (rad/sec) 75th floor acceleration 1.01 1.13 50th floor acceleration 8.17 8.80 30th floor acceleration 17.59 20.73 ure 3.4(a)) while the processing effect is trivial wh en the target response is 30th or 50th floor acceleration of which transfer functi on has zero away from the first modal one.

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5.4(a)) while the processing effect is trivial when the target response is 30th or 5 0th floor acceleration of which transfer function has zero away from the first m odal one.

문장표절률: **97%**

Also, it is known from observing the error dis- tribution that the targeted respon ses are almost identical to wind-induced ones with a small magnitude of error w hile the other non-targeted responses are slightly different withincreasing error.

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Also, it is known from observing the error dis tribution that the targeted respons es are almost identical to wind-induced ones with small magnitude of error whil e the other non-targeted responses are slightly different withincreasing error.

문장표절률: **100%**

Targeting 30th or 50th-floor ac- celeration provides greater discrepancy betwe en the wind and LMS induced 75-floor accelerations which are critical in evalua ting service ability.

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Targeting 30th or 50th floor ac celeration provides greater discrepancy between the wind and LMS induced 75-floor accelerations which are critical in evaluatin g service ability.

문장표절률: **54%**

The com- parison between the results in Figure 3.7(a) and 3.7(b) indicates that t he distribution tendency of et and ef is quite different and the magnitude of et is much larger than that of ef .

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

The com parison between the results in Fig. 5.7(a) and (b) indicates that the 72 5. DESIGN OF AN ACTUATOR FOR SIMULATING WIND RESPONSE distribu tion tendency of et and ef is quite different and the magnitude of et is much larg er than that of ef .

문장표절률: **95%**

When targeting response is 75th floor acceleration, both values of et and ef are smallest for the targeted 75th floor .BHOJUVEF .

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

When targeting response is 75th floor acceleration, both values of et and ef are smallest for the targeted 75th floor acceleration, but the value of ef becomes lar ger for the otherstory responses while the value of er generally keeps the smallest except for 30th story acceleration.

문장표절률: **39%**

82 Chapter. 3. Design of Excitation System for Simulating Dynamic Loads accel eration, but the value of ef becomes larger for the otherstory responses while the value of ef generally keeps the smallest except for 30th story accel- eration.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
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When targeting response is 75th floor accel eration, both values of et and ef are smallest for the targeted 75th floor accel eration, but the value of ef becomes lar ger for the otherstory responses while the value of er generally keeps the smallest except for 30th story accel eration.

문장표절률: **61%**

The larger value of et results from the phase difference between the wind and L MS induced responses since et is obtained based on the response difference at th e same time step.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

The larger value of et results from the phase difference between wind and LMS i nduced responses since et is obtained based on the response difference at the sa me time step.

문장표절률: **41%**

The phase of the wind-induced response is not the important parameter in evalu ating the wind resistance performance of a buildingstructure, ef can be said to b e the more appropriate index for evaluating the wind response reproducing the p erformance of LMS.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

The phase of the wind induced response is not important parameter in evaluating the wind resistance performance of a buildingstructure, ef can be said to be mor e appropriate index for evaluating the wind response reproducing performance o f LMS.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

The phase of the wind induced response is not important parameter in evaluating the wind resistance performance of a buildingstructure, ef can be said to be mor e appropriate index for evaluating the wind response reproducing performance o f LMS.

문장표절률: **24%**

U U I UI I P P P PP S PS S U U B UB S BS H SH FU VOQSPDFTTFE HFFUU VVOQSPDFTTFE UUII PPS UBSHFU Q OSPQDSFPTDFTTFE I PPPPSS UUB BS TFE U SHHFFUU QQSSPPDDFFTTTTFFEE (a) et (b) ef Figure 3.7: Error distribution according to the filter usage and floor of target response.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

75 70 65 60 55 50 30 i 1 e Figure 5-7 Error distribution according to the filter usage and floor of target response 73 5. DESIGN OF AN ACTUATOR FOR SIMULATING WIND RESPONSE Figs.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Frequency response of 75th floor with LMD forcetargeting DISPLACEMENT RESPONSE.....71 Figure 5-7 Error distribution according to the filter usage and floor of target RESPONSE.....73 Figure 5-8.

문장표절률: **71%**

Figures 3.8 and 3.9 compare the time histories of the wind and LMS induced structural responses for the cases that the target responses are, respectively, 75th and 30th-floor accelerations and filter are applied for the design of LMS.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

5.8 and 5.9 compare the time histories of the wind and LMS induced structural responses for the cases that the target responses are, respectively, 75th and 30th floor accelerations and filter is applied for the design of LMS.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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5.8 and 5.9 compare the time histories of the wind and LMS induced structural responses for the cases that the target responses are, respectively, 75th and 30th floor accelerations and filter is applied for the design of LMS.

문장표절률: **28%**

Figure 3.8 shows that the LMS induced acceleration response 83 Chapter. 3. Design of Excitation System for Simulating Dynamic Loads including targeted 75th-floor acceleration agree well with wind-induced ones while displacement responses at all floors are undere observed in Figure 3.9 that the shaker simulated targeted 30th-floor ac- celeration as well as displacement responses but overestimates 75th-floor acceleration.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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Fig. 5.8 shows that the LMS induced acceleration response including targeted 75th floor acceleration agree well with wind-induced ones while displacement responses at all floors are underestimated by LMS- II is observed in Fig.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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발행 : 서울: 檀國大學校, 2006

Fig. 5.8 shows that the LMS induced acceleration response including targeted 75th floor acceleration agree well with wind-induced ones while displacement responses at all floors are underestimated by LMS.

문장표절률: **13%**

DFMFSBUJPO N T QMBDFNFOU N 5J N F T F D PO E 5 JN F TF DPO E (a) 76th story acceleration response (b) 76th story displacement response %JTQMB QMBDFNFOU N 5 JN F T F DPO E 5 JN F T F DPO E (c) 50th story acceleration response (d) 50th story displacement response %JTQMB X -.JO4E JJ OOEEVVDDFFEE QMBDFNFOU N XFYJODJEU FJOS EJOVEDVFDEFE 5 J N F T F DPO E 5 JN F T F DPO E (e) 30th story acceleration response (f) 30th story displacement response Figure 3.8: Wind and LMS induced acceleration responses (when the target is 75th floor acceleration).

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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Wind and LMS induced acceleration responses (when the target is 75th floor acceleration).....74 Figure 5-9. Wind and LMS induced acceleration responses (when the target is 30th floor acceleration).....75 Figure 5-10.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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Error distribution according to the filter usage and floor of target RESPONSE.....th.....73 Figure 5-8 Wind and LMS induced acceleration responses (when the target is 75th floor acceleration).....74 Figure 5-9.

문장표절률: **95%**

3.1.4 ATMD excitation In the 76th story building benchmark problem, ATMD is used as an example controller, which is composed of spring and viscous damper in addition to the mass and actuator of the LMS.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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발행 : 서울: 檀國大學校, 2006

Wind and LMS induced acceleration responses (when the target is 30th floor acceleration) 5.4.4 ATMD excitation In the 76th story building benchmark problem, ATMD is used as an example controller, which is composed of spring and viscous damper in addition to the mass and actuator of the LMS.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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Wind and LMS induced acceleration responses (when the target is 30th floor acceleration) 5-4.4 ATMD excitation In the 76th story building benchmark problem, ATMD is used as an example controller, which is composed of spring and viscous damper in addition to the mass and actuator of the LMS.

문장표절률: **91%**

Figure 3.11 shows the time history comparison between wind induced acceleration and ATMD induced one targeting on 75th story acceleration response.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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Wind and ATMD induced acceleration responses (when the targetis 75th floor acceleralion) Fig. 5.11 shows the time history comparison between wind induced acceleration and ATMD induced one targeting on 75th story acceleration response.

문장표절률: **100%**

All acceleration responses coincide well with each other, but in displace- ment response, there exists slight underestimation and overestimation ac- cording to the time ranges.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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발행 : 서울 : 단국대학교 대학원, 2007.2

All acceleration responses coincide well with each other, but in displace ment response, there exists slight underestimation and overestimation ac cording to the time ranges.

문장표절률: **93%**

Figure 3.12 shows the comparison between the frequency responses of 75th floor acceleration and it is observed that wind and ATMD induced responses show good agreement overall frequency range.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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oo-o-oo.:o.<-0.-0.:o ^ (2S/U0 uollejalsov uo!J2ala).8v QS/트 uojjejalasv 77 5. DESIGN OF AN ACTUATOR FOR SIMULATING WIND RESPONSE Fig. 5.12 shows the comparison between the frequency responses of 75th floor acceleration and it is observed that wind and ATMD induced responses show good agreement overall frequency range.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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발행 : 서울: 檀國大學校, 2006

(uo Hia>Ea>oelQ.SIQ -0-0 수 S/E) uo!J2c)laoov 77 5. DESIGN OF AN ACTUATOR FOR SIMULATING WIND RESPONSE Fig. 5.12 shows the comparison between the frequency responses of 75th floor acceleration and it is observed that wind and ATMD induced responses show good agreement overall frequency range.

문장표절률: **94%**

Figure 3.13 shows the error distribution according to the floor of targeted acceleration response. From Figure 3.13(b) showing that ef has the smallest value over floors when the target response is 75th floor acceleration, and the corresponding value ranges only between 1% and 10%, ATMD targeting 75th floor acceleration can be said to provide the best performance, and it can exactly reproduce the wind-induced acceleration response of all floors including targeted 75th floor.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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5.13 shows the error distribution according to the floor of targeted acceleration response. From Fig. 5.13(b) showing that ef has the smallest value over floors when the target response is 75lh floor acceleration and the corresponding value ranges only between 1% and 10%, ATMD targeting 75th floor acceleration can be said to provide best performance and it can exactly reproduce the wind-induced acceleration response of all floors including targeted 75th floor 78 5.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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5.13 shows the error distribution according to the floor of targeted acceleration response. From Fig. 5.13(b) showing that ef has the smallest value over floors when the target response is 75th floor acceleration and the corresponding value ranges only between 1% and 10%, ATMD targeting 75,h floor acceleration can be said to provide best performance and it can exactly reproduce the wind-induced acceleration response of all floors including targeted 75th floor.

문장표절률: **58%**

3.1.5 Comparison between LMS and ATMD Figure 3.14 shows time history of the actuator forces in LMS and ATMD excitation systems.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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Enor Distribution with ATMD excitation 5.4.5 Comparison between LMS and ATMD Fig. 5.14 shows time history of the actuator forces in LMS and ATMD ex

citation systems.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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5.14 shows time history of the actuator forces in LMS and ATMD excitation systems. The peak actuator force required for ATMD is larger than that for LMS.

문장표절률: **50%**

The peak actuator force required for ATMD is larger than that for LMS. Figure 3.15 compares the stroke of LMS with/without filter and ATMD.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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The peak actuator force required for ATMD is larger than that for LMS. Fig. 5. 15 compares the stroke of LMS with/without filter and ATMD.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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5.14 shows time history of the actuator forces in LMS and ATMD excitation systems. The peak actuator force required for ATMD is larger than that for LMS.

문장표절률: **100%**

The stroke of LMS with filter is much smaller than those of LMS without filter and ATMD. This fact implies that ATMD requires largestroke to show good performance in wind-induced response realization and this stroke requirementshould be checked in the design of ATMD.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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This fact implies that ATMD requires largesiroke in order to show good performance in wind-induced response realization and this stroke requirementshould be checked in the design of ATMD.

인용포함 문장 문장표절률: **13%**

86 Chapter. 3. Design of Excitation System for Simulating Dyna 5J N F T F DP O E 5 JN F TFDPO E %JTQMBDFNFOU N ic Loads (a) 76th story acceleration response (b) 76th story displacement response 5 JN F T F DPO E 5 JN F TF DPO E %JTQMBDFNFOU N (c) 50th story acceleration response (d) 50th story displacement response X"5JO.E% JO JEOVEDVFDEFE N X"5JO.E %JO JEO VEDVFDEFE 5J N F T F DPO E 5 JN F TFDPO E %JTQMBDFNFOU N (e) 30th story acceleration response (f) 30th story displacement response Figure 3.11 : Wind and ATMD induced acceleration responses (when the target is 75th floor acceleration).

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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발행 : 서울: 檀國大學校, 2006

ATMD Excitation.....76 Figure 5-11 Wind and ATMD induced acceleration responses (when the target is 75th floor acceleration).....77 Figure 5-12.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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Wind and ATMD induced acceleration responses (when the target is 75th FLOOR ACCELERATION).....77 Figure 5-12. Frequency response of wind and ATMD induced 75th floor ACCHLHRATIONS.....78 Figure 5-13.

문장표절률: **70%**

Table 3.2 shows thenumerical values of the error, actuator force, and actuator stroke in LMS with/without the filter, and ATMD systems.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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발행 : 서울: 檀國大學校, 2006

Comparison between actuator forces in LMS and ATMD s 3〉laili(0 M i〉io 리is { s3〉IOiL^ {n〉0 80 5. DESIGN OF AN ACTUATOR FOR SIMULATING WIND RESPONSE Table 5.2 shows thenumerical values of the error, actuator force, and actuator stroke in LMS with/without filter, and ATMD systems.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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발행 : 서울 : 단국대학교 대학원, 2007.2

Stroke Comparison o?} SOHrs d) bet sLuocco 니I ?) 3〉l이iLS Fi] 80 5. DESIGN OF AN ACTUATOR FOR SIMULATING WIND RESPONSE Table 5. 2 shows thenumerical values of the error, actuator force, and actuator stroke in LMS with/without filter, and ATMD systems.

문장표절률: **100%**

The errors are obtained when the target and evaluation responses are identical, and actuator force and stroke are obtained when the target response is 75th- floor acceleration.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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발행 : 서울: 檀國大學校, 2006

The errors are obtained when the target and evaluation responses are identical, and actuator force and stroke are obtained when the target response is 75th floor acceleration.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

The errors are obtained when the target and evaluation responses are identical, and actuator force and stroke are obtained when the target response is 75th floor acceleration.

문장표절률: **56%**

The facts observed from Figures 3.14 and 3.15 that the performance of LMS can be enhanced using the band-stop filter and ATMD reproduces wind-induced response better than LMS, but ATMD requires larger actuator force and stroke can be identified once more.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

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저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

The facts observed from Figs. 5.14 and 5.15 that the performance of LMS can be enhanced using band-stop filter and ATMD reproduces wind-induced response better than LMS but ATMD requires larger actuator force and stroke can be identified once more.

문장표절률: **80%**

3.1.6 Summary The design of excitation systems for simulating wind-induced responses of a buildingstructure was presented as a preliminary study for evaluating wind-resistance characteristics of buildingstructures.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Table 5-2. Comparison between LMS and ATMD LMS (unfiltercd) LMS (filtered) ATMD 75lh floor acceleration er 0.117 0.192 0.074 ef 0.054 0.011 0.003 50th floor acceleration e, 0.081 0.081 0.083 ef 0.219 f? 0.213 0.525 30th floor acceleration e, 0.082 0.082 0.082 ef 0.034 0.033 0.065 Stroke Peak (m) 1.402 0.519 1.265 RMS (m) 0.436 0.183 0.333 Actuator force Peak (kN) 1068.22 441.68 655.78 RMS (kN) 323-92 136.44 170.39 5.5 Concluding Remarks Design of excitation systems for simulating wind induced responses of a buildingstructure was presented as a preliminary study for evaluating wind-resistance characteristics of practical buildingstructures.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

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문장표절률: **100%**

The actuator forces of the LMS and ATMD were obtained using the inverse transfer function of structural responses. Also, band stop filter was used in LMS to remove zero of the transfer functionsuch that undesirable modal excitation is prevented and envelop function was used to reduce the error occurring in transient initial states in both LMS and ATMD.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

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저자 : 박은천
발행 : 서울: 檀國大學校, 2006

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문장표절률: **89%**

The numerical analyses results from a 76-story benchmark building confirmed t hat the structural responses of a 87 Chapter.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

The numerical analyses results from a 76-story benchmark building confirmed t hat the structural responses of a buildingstructure excited by wind loads acting a t all floors could be reproduced by the proposed linear shaker installed at a speci fic floor.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

The 81 5. DESIGN OF AN ACTUATOR FOR SIMULATING WIND RESPON SE numerical analyses results from a 76-story benchmark building confirmed th at the structural responses of a buildingstnicture excited by wind loads acting at all floors could be reproduced by the proposed excitation systems installed at a specific floor.

문장표절률: **100%**

Secondly, valuable data, which are available for the verification of structural seis mic performance and the evaluation of the availability of vibration technique req uired in structural health monitoring, can be acquired from the test.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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발행 : 서울 : 단국대학교 대학원, 2007.2

Secondly, valuable data, which are available for the verification of structural seis mic performance and the evaluation of the availability of vibration technique req uired in structural health monitoring, can be acquired from the test.

문장표절률: **72%**

Thirdly, large shaking table is not required to evaluate the seismic response of re al-scaled build- ing structures, since in this study the earthquake response is sim ulated by actuating a structure with an HMD installed at the upper story.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Thirdly, large shaking table is not required to evaluate the seismic response of re al-scaled build ing structures, since in this study the earthquake response is simu lated by exciting a structure with a HMD installed at upper story.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Thirdly, large shaking table is not required to evaluate the seismic response of re al-scaled build ing structures, since in this study the earthquake response is simu lated by exciting a structure with a HMD installed at upper story.

문장표절률: **84%**

3.2.2 Experimental Real-Scale Building Model The experimental model, which is shown in Figures 3.16 and 3.17, is a full- scale five-story steel structure which h as the story height of 6m, the plan of 6m x 6m, and the story mass of 20,000k g.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

6.2 Experimental Real-Scale Building Model The experimental model, which is s hown in Figure 3, is a full- scale five-story steel structure which has the story he ight of 6m, the plan of 6m x 6m, and the story mass of 20,000kg* Each floor i s composed of four identical wide-flange type steel columns.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

6.2 Experimental Real-Scale Building Model The experimental model, which is s hown in Figure 3, is a fhll- scale five-story steel structure which has the story he ight of 6m, the plan of 6m x 6m, and the story mass of 20,000kg.

문장표절률: **41%**

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시

Each floor is composed of four identical wide-flange type steel columns. An HMD using larger scale linear motor damper which was also designed as a passive damper has a moving mass on the fifth floor excited the modelstructure.

스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Each floor is composed of four identical wide-flange type steel columns. A HMD using larger scale linear motor damper which was also designed as a passive damper has moving mass on the fifth floor excited the modelstructure.

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저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

A HMD using larger scale linear motor damper which was also designed as a passive damper has moving mass on the fifth floor excited the modelstructure.

문장표절률: **45%**

Because the columns consist of I-shaped steel, the HMD was installed in minor axis of the structure. 3.2.3 Field measurement and experimental system Field measurement and experimental system is shown in Figures 3.18 and 3.19.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Because the columns consist of I-shaped steel, the HMD was installed in minor axis of the structure. 6. FORCED VIBRATION TEST OF REAL-SCALE FIVE STORY STRUCTURE (5) C-150X75X25X3.: ^ 1500 3.L +30100 MINOR AXES 100 MAJOR AXES 100 (a) minor axis (b) major axis Figure 6-1.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
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Because the columns consist of I-shaped steel, the HMD was installed in minor axis of the structure. 85 6. FORCED VIBRATION TEST OF REAL-SCALE FIVE STORY STRUCTURE © © © © T m 丁 3200 丁 6C00 85S 丁 LLi ≫.

문장표절률: **94%**

In order to minimize the latency between the excitation and the mea- surement, one lap-top PC in the experimental system was used for simul- taneously implementing the excitation and the measurement.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

6.3 and 6.4. To minimize the latency between the excitation and the mea surement, one lap-top PC in the experimental system was used for simul taneously implementing the excitation and the measurement.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

6.3 and 6.4. To minimize the latency between the excitation and the mea surement, one lap-top PC in the experimental system was used for simul taneously implementing the excitation and the measurement.

문장표절률: **100%**

The measure- ment system has accelerometers, PCB Corp. 393B12 model was installed at the center of the 2nd 5th floor and KYOWA Corp.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

The measure ment system has accelerometers, PCB Corp. 393B12 model was installed at the center of the 2nd 5th floor and KYOWA Corp.

문장표절률: **22%**

AS-2GB model was attached to the HMD. PCB Monitran and KYOWA DPM-711B was used 91 Chapter. 3. Design of Excitation System for Simulating Dynamic Loads 9 9 : : (*35)) 9(- !$ 9 9 9 (300' $ $ $ (- # (# 5) $ $ $ (- (5) $ $ $ (- (3% $ $ $ (- (/% $ $ $ (- 45 '$ '$ '$ ' 9 9 $(*35) (- ! 9 9 9 (300' $ (- (# 5) $ (- (5) $ (- (3% $ (- (/% $ (- 45 '$ ' 4 .*/03 "9 & 4 4 ."+03 "9 & 4 (a) minor axis (b) major axis Figure 3.16: Elevation view of the targetstructure.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

AS-2GB model was attached to the HMD. PCB Monitran and KYOWA DPM-711B was used to amplify their measured signals. The data cabling connection system has BNC cable with lengths of 25m and 50m.

문장표절률: **55%**

to amplify their measured signals. The data cabling connection system has BNC cable with lengths of 25m and 50m. In the data acquisitionsystem, the DAQ board of NI DAQCard-6036E with 16bit-range was used to perform the AD and

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천

DA conversion.

발행 : 서울 : 단국대학교 대학원, 2007.2

In the data acquisitionsystem, the DAQ board of NI DAQCard-6036E with 16 bit-range was used to perform the AD and DA conversion.

문장표절률: **92%**

Also, it was connected to the signal conditioner of NI SCC-2345 by using both the input modules and the output module. 92 Chapter.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Also, it was connected to the signal conditioner of NI SCC-2345 by using both the input modules and the output module. In this excitation system, both excitation and measurement signals arevoltage signals and this excitation signal transfer^equivalent thrust generated according to the input voltage signal through the inverter of HMD, to the mass of HMD.

문장표절률: **29%**

%JTQMBDFNFOU NN &)B.SU%I JROVEBVLDFF JEO E&VYDQFFES J N" OFBOMUZ TJT (e) 5th floor acceleration of Hachinohe (f) 1st floor displacement of Hachinohe earthquake excitation earthquake excitation Figure 3.29: Time history comparison of Hachinohe earthquake response in the analysis and experimental models.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Time history comparison of Hachinohe earthquake response in the analysis and experimental models, (when the target response is the 5th floor acceleration) Fig.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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발행 : 서울 : 단국대학교 대학원, 2007.2

Time history comparison of Hachinohe earthquake response in the analysis and experimental models, (when the target response is the 5th floor acceleration) Fig.

문장표절률: **54%**

(when the target response is the 5th-floor acceleration). frequency was shown, but it would not reflect the responses at the third mode or higher mode frequency in Figures 3.30(a)-3.30(c).

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

6.15 comparesthe result in frequency domain of Hachinohe earthquake response in analysis model and experimental one. It is observed that the coincidence of the response at the first mode and second mode frequency was shown, but it would not reflect the responses at the third mode or higher mode frequency in Figs.6.15 (a)-(c) 104 6.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

6.15 comparesthe result in frequency domain of Hachinohe earthquake response in analysis model and experimental one. It is observed that the coincidence of the response at the first mode and second mode frequency was shown, blit it would not reflect the responses at the third mode or higher mode frequency in Figs.6.15 (a)-(c) 104 6.

문장표절률: **88%**

3.2.7 Error Analysis The normalized RMS error between the absolute acceleration induced by HMD and the base acceleration could be express as Eq.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

FORCED VIBRATION TEST OF REAL-SCALE FIVE STORY STRUCTURE 6.6.2 Error Analysis The normalized RMS error between the absolute acceleration induced by HMD and the base acceleration could be express as Eq.(6.13).

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
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FORCED VIBRATION TEST OF REAL-SCALE FIVE STORY STRUCTURE 6.6.2 Error Analysis The normalized RMS error between the absolute acceleration induced by HMD and the base acceleration could be express as Eq.(6-13).

문장표절률: **89%**

(3.23). Figure 3.31 is shown the floor distribute errors corresponding to the target responses of the analysis FE model. All responses are contained 10-20% error values and the minimal error value presented when the target response consider the 5th-floor acceleration.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

Fig. 6.16 is shown the floor distribute errors corresponding to the target responses of the analysis FE modeL All responses are contained 10 20% error values and the minimal error value presented when the target response consider the 5th floor acceleration.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시

스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Fig. 6.16 is shown the floor distribute errors corresponding to the target responses of the analysis FE model. All responses are contained 10~그00/o error values and the minimal error value presented when the target response consider the 5th floor acceleration.

문장표절률: **36%**

Σ √ }√Tt=0 ÿΣg(t)2Normalized RMS Error(%) = {√− ΣT t=0 ÿh(t) 2 T 2 t=0 ÿg(t) (3.23) where ÿg, ÿh are the structural acceleration responses which are the base acceleration and the HMD acceleration induced.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures

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where yh are the structural acceleration responses which are the base acceleration and the HMD acceleration induced. T is total excitation time of the earthquakes.

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where)상, yh are the structural acceleration responses which are the base acceleration and the HMD acceleration induced.

문장표절률: **55%**

Then the MR damper can control the buildingstructure with the generated current. Finally, the MR damper-based semiactive feedback control system, which has 12 inputs and two outputs, can be formed as shown in Figure 3.3.5.

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Then the MR damper is able to control the buildingstructure with the generated current. Finally the MR damper-based semiactive feedback control system, which has 12 inputs and 2 outputs, can be formed as Fig.

문장표절률: **48%**

The CO, as well as the cost function-based SNC algorithm, needs full state or the specific state of the structural system in order to calculate the appropriate desired control force.

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5. The clipped-optimal control algorithm as well as the cost function-based semiactive neuro-control algorithm [5] needs full state or specific state of the structural system in order to calculate the appropriate desired control force.

문장표절률: **77%**

The control implementation requires a lot of sensors, and that would be even impossible. Therefore the Kalman filters as an observer for state estimation is desirable.

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Actually the control implementation requires a large amount of sensors and that would be even impossible. Therefore the Kalman filters as an observer for state estimation is desirable.

문장표절률: **21%**

Consider a controllable and observable system and assume that full state estimation is required. Then 111 Chapter. 3. Design of Excitation System for Simulating Dynamic Loads t ´ ´ ´ 1PXFS TQFDUSBM EFOTJUZ VFODZ)[5JNF T ' SF R (a) Scaled Northridge earthquake 1PXFS TQFDUSBM EFOTJUZ ´ 5JNF T ' S F RVFODZ) [(b) Kanai-Tajimi filtered artificial earthquake Figure 3.35: Acceleration of HMD and PSD used as external excitation load.

[iiav.org] Unified Semiactive Control System Based on MR Damper for Cable ...

Consider a controllable and observable system and assume that full state estimation is required. Then the main purpose of the general Kalman filter is constructing a state estimate xˆ(t) that minimizes the steady-state error covariance which is defined by:] P = lim E([x − xˆ t→∞ x − xˆ]T) .

문장표절률: **23%**

the main purpose of the general Kalman filter is constructing a state estimate x̂(t) that minimizes the steady-sta(te error covarianc)e which is defined by: P = lim [x− x̂] [x− x̂]〉 (3.24) t→∞E The optimal estimator for the state of interest is the Kalman filter which can be expressed as: x̂ = (A− [{ } [ ] LC[) x̂ +]L{B}−] y L D u ŷ C 0 D y = x̂ + x̂ I 0 0 u (3.25) where filter gain L is determined by solving an algebraic Riccati equation.

[iiav.org] Unified Semiactive Control System Based on MR Damper for Cable ...

(2) 302 4 ICSV15 · 6-10 July 2008 · Daejeon · Korea Fig. 5. MR damper-based semiactive feedback control system The optimal estimator for the state of interest is the Kalman filter which can be expressed as x̂ = (A LC) xˆ + [L ⌈ɬyˆ⌉ = ⌈ C⌉xˆ + ⌈0⌊xˆ⌋ ⊦⌊⌊ I ⌋⌋⌊0 − ⌈y⌉B LD]ɬ ⌊u⊦⌋ ⌉⌈ .

문장표절률: **71%**

The Kalman filter uses the known input u and the measurements y to generate the output and state estimates, that is, ŷ and x̂.

[iiav.org] Unified Semiactive Control System Based on MR Damper for Cable ...

(3) D 0 ⌋⌋ɬ yⁿ ⌊uJ ⊦ where filter gain L is determined by solving an algebraic Riccati equation. The Kalman filter uses the known inputs u and the measurements y to generate the output and state estimates, that is, ŷ and x̂ .

문장표절률: **57%**

The lower part of the entire structure or whole buildingstructure is modeled numerically. In order to verify the validity and accuracy of the proposed technique, a shaking tabletest was conducted.

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저자 : 박은천
발행 : 서울: 檀國大學校, 2006

In order to verify the validity and accuracy of the proposed technique, a shaking tabletest was conducted. The result of the study can be summarized as follows .

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In order to verify the validity and accuracy of the proposed technique, a shakin

g tabletest was conducted. The result of the study can be summarized as follows .

문장표절률: **75%**

The result of the study can be summarized as follows. 1. To reduce the distortion of the interface acceleration, the inverse trans- fer function of the shaking table was identified, and its statespace realization wasimplemented in the shaking table controller.

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(1 To reduce the distortion of the interface acceleration, the inverse trans fer function of the shaking table was identified and its statespace realization wasimplemented in the shaking table controller.

문장표절률: **66%**

2. In this paper, the linear transfer function approach for controlling themotion of a shaking table was considered to verify the proposed method for a linear experimental part experimentally.

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저자 : 박은천
발행 : 서울: 檀國大學校, 2006

The result of the study can be summarized as follows. (1) The linear transfer function approach for controlling themotion of a shaking table was considered to experimentally verify the proposed method for a linear experimental part.

문장표절률: **53%**

However, this approach would be inappropriate in a coupled non-linear system lead- ing to experimental instability. Therefore, in such case, the controller using the inverse transfer function of shaking table, shown in Fig- ure 2.6, would be modified to compensate an experimental instability.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계
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However, this approafii would be inappropriate for a coupled non-linear system leading to experimental instability. Therefore, in such case the controller using the inverse transfer function of shaking table would be modified to compensate an experimental instability.

문장표절률: **95%**

3. The interface force between the experimental and numerical substruc- tures was obtained using only acceleration measurement and mass in- formation so that high-capacity loads cell and installation jigs are not required in the substructuring technique.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
저자 : 박은천
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11,would be modified to compensate an experimental instability. (3 The interface force between the experimental and numerical substruc tures was obtained using only acceleration measurement and mass in formation so that high-capacity loads cell and installation jigs are not required in the experiment.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계
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11,would be modified to compensate an experimental instability. (3 The interface force between the experimental and numerical substruc tures was obtained using only acceleration measurement and mass in formation so that liigh-capacity loads cell and installation jigs are not required in the experiment.

문장표절률: **73%**

4. The proposed method basing the interface force measurement on accel- eration measurements from an experimental substructure is partially available only when the mass distribution is discrete - for example, this technique would be applic

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and real-time hybrid test method of building structures
저자 : 박은천

able to the TMD as an experimental part.

발행 : 서울 : 단국대학교 대학원, 2007.2

(4 The proposed method basing the interface force measurement on accel eratio n measurements from an experimental substructure is partially available only whe n the mass distribution is discrete – for example this would be applicable to the T MD as an experimental part.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

(4 The proposed method basing the interface force measurement on accel eratio n measurements fiom an experimental substructure is partially available only whe n the mass distribution is discrete – for example this would be applicable to the T MD as an experimental part.

문장표절률: **100%**

Also, the interface force measurement using force transducers is required to perf orm the proposed method when wind forces are applied to the experimental subs tructure.

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발행 : 서울 : 단국대학교 대학원, 2007.2

Also, the interface force measurement using force transducers is required to perf orm the proposed method when wind forces are applied to the experimental subs tructure.

문장표절률: **83%**

147 Chapter. 5. Conclusions 6. An unexpected vibration of the experimental subs tructure can be induced by the feedback of responses including its inherent natur al modes and then by the error occurred in calculating the numerical substructur e.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

(6) Unexpected vibration of the experimental substructure can be induced by the feedback of responses including its inherent natural modes and then by the error occurred in calculating the numerical substructure.

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(6) Unexpected vibration of the experimental substructure can be induced by the feedback of responses including its inherent natural modes and then by the error occurred in calculating the numerical substructure.

문장표절률: **66%**

7. It is considered that to minimize the effect of natural modes of an experimenta l substructure on the substructured system, the structural model as heavily-dam ped as possible would be used as an experimental part.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

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(2) It is considered that to minimize the effect of natural modes of an experiment al substructure on the substructured system, the structural model as havily-dam ped as possible would be used as an experimental part.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

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(2) It is considered that to minimize the effect of natural modes of an experiment al substructure on the substructured system, the structural model as havily-dam ped as possible would be used as an experimental part.

문장표절률: **73%**

8. The proposed technique can be extended to the substructuring tech- nique wit h themiddle part of a whole structure in combination with the conventional subst ructuring technique employing lower part as the experimental substructure.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

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REAL-TIME SUBSTRUCTURING TECHNIQUE possible would be used as an experimental part. (8 The proposed technique can be extended to the real-time s ubstructuring tech nique with themiddle part of a whole structure in combination with the conventional substructuring technique employing lower part as the exper imental substructure.

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발행 : 서울: 檀國大學校, 2006

REAL-TIME SUB STRUCTURING TECHNIQUE possible would be used as an experimental part. (8 The proposed technique can be extended to the real-time s ubstriictiuing tech nique with themiddle part of a whole structure in combination with the conventional substmctiuiiig technique employing lower part as the experi mental substructure.

문장표절률: **82%**

9. The TLD installed on the top floor of the structure is physically tested, and si multaneously numerical calculation is carried out for the as- sumed analytical st ructural model.

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The TLD installed at the top floor of the structure is physically tested, and simult aneously numerical calculation is carried out for the as sumed analytical structur al model.

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The TLCD installed at the top floor of the structure is physically tested, and sim ultaneously numerical calculation is carried out for the as sumed analytical struc tural model.

문장표절률: **26%**

10. Comparison between the structural responses obtained by the hybrid testing method and the conventional shaking tabletest of a single story steel frame with TLD and TLCD indicates that the performance of the TLD and TLCD can be a ccurately evaluated using the hybrid testing method without the physical structur al model.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

Comparison between the structural responses obtained by the RHSTTM and the conventional shaking tabletest of a single story steel frame with TLD/TLCD indi cates that the performance of the TLD/TLCD can be accurately evaluated using the RHSTTM without the physical structural model.

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Comparison between the structural responses obtained by the RHSTTM and the conventional shaking tabletest of a single story steel frame with TLD/TLCD indi cates that the performance of the TLD/TLCD can be accurately evaluated using the RHSTTM without the physical structural model.

문장표절률: **88%**

11. The uncontrolled and TLD-controlled structural responses of a three- story structure are obtained by the hybrid testing method in both time and frequency d omains, showing that TLD can effectively mitigate the seismic responses of buil dingstructures and the hybrid testing method can reproduce the dynamic behavi or of TLD-structure interactionsys- tems for both the uncontrolled and controll ed case.

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Finally the uncontrolled and TLD-controlled structural responses of a three stor y structure are obtained by the RHSTTM in both time and frequency domains, s howing that TLD can effectively mitigate the seismic responses of buildingstruct ures and the RHSTTM can reproduce the dynamic behavior of TLD-structure i nteractionsys tems for both the uncontrolled and controlled case.

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Finally the uncontrolled and TLD-controlled structural responses of a three stor y stmcture are obtained by the RHSTTM in both time and frequency domains, s howing that TLD can effectively mitigate the seismic responses of buildingstruct ures and the RHSTTM can reproduce the dynamic behavior of TLD-structure i nteractionsys tems for both the imcontroiled and controlled case.

문장표절률: **64%**

Secondary, this paper presents the design of excitation systems for sim- ulating dynamic loads. The controller design of an actuator is presented to simulate the responses of a buildingstructure subjected to such dynamic excitations as earthq uakes and wind loads.

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저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

The controller design of an actuator is presented to simulate the responses of a

buildingstructure subjected to such dynamic excitations as earthquakes and win d loads.

문장표절률: **73%**

The result of the study can be summarized as follows. 1. A design of a shaker fo r simulating wind-induced responses of a build- ing structure was presented as a preliminary study for evaluating wind- resistance characteristics of practical b uildingstructures.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계

저자 : 박은천
발행 : 서울: 檀國大學校, 2006

109 7. Conclusions (5) A design of a shaker for simulating wind induced respon ses of a build ing structure was presented as a preliminary study for evaluating wind- resistance characteristics of practical buildingstructures.

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저자 : 박은천
발행 : 서울 : 단국대학교 대학원, 2007.2

109 □. Conclusions (5) A design of a shaker for simulating wind induced respo nses of a build ing structure was presented as a preliminary study for evaluating wind- resistance characteristics of practical buildingstructures.

문장표절률: **76%**

148 Chapter. 5. Conclusions 2. The force of the shaker was obtained using the i nverse transfer func- tion of structural responses.

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(6) The force of the shaker was obtained using the inverse transfer func tion of structural responses. Also, band stop filter was used to remove zero of the trans fer func tionsuch that undesirable modal excitation is prevented, and envelop fim c tion was used to reduce the error occurring in transient initial states.

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문장표절률: **100%**

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문장표절률: **98%**

3. The numerical analyses results from a 76-story benchmark building confirme d that the structural responses of a buildingstructure excited by wind loads actin g at all floors could be reproduced by the proposed linear shaker installed at a s pecific floor.

[Copykiller] 건축구조물의 동적하중 구현 및 실시간 하이브리드 실험을 위한 가진시스템 설계 = Design of excitation systems for simulating dynamic loads and re al-time hybrid test method of building structures

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문장표절률: **97%**

4. The performances of the excitation systems were dependent on type and posit

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The performances of the excitation systems were dependent on type and position of the targetstructural response for which acceleration re sponse was suitable because targeting displacement response required large and high-speed changing control force.

문장표절률: **86%**

5. In order to enhance practical applicability of the wind responsesim- ulating excitation systems, finite element model updating based on measured data, and the scaling or restriction of the excitation force or stroke limit for avoiding damage to the practical building etc.

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문장표절률: **88%**

should be considered 6. The field measurementsystem of full-scale structure and excitation system were established, and thenforced vibration test was carried out using the Hybrid Mass Damper designed to simulate seismic load.

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문장표절률: **57%**

7. System identification of full-scalestructure was carried out through white noise test, and the finite element modelis updated from mea- sured data.

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(8) System identification of full-scalestructure was carried out through white noise test and Finite Element (FE) modelis updated.

문장표절률: **95%**

8. The seismic excitation system was accomplished through inverse trans- fer functions of structure and HMD by the system identifications.

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