

CURRICULUM VITAE

(Last updated: 2026.07.19.)

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AFFILIATION

M.S Candidate (2025.03. ~ Current)

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EDUCATION

2019.03-2025.02

B.S Mechanical engineering

Keimyung university

MASTER RESEARCH

“Genetic Algorithm-Based Contact Region Search for Improving Frequency Response Correlation”

This study presents a genetic algorithm-based contact region search framework for improving the correlation accuracy of frequency response in assembled structures with uncertain contact conditions. By dividing potential contact regions into multiple patches and defining the contact state of each patch as a design variable, the proposed framework searches for the contact region configuration that maximizes the frequency response correlation between test and analysis results. The framework was first validated using L-shaped and U-shaped simple models, where it successfully identified the target contact region configurations in all cases. It was then applied to the cabinet of an F/L washing machine, whose potential contact regions were divided into 181 patches. The optimized contact region configuration consisted of 92 patches and improved the FRF correlation coefficient by approximately 28.03% compared with the fully contacted model. The optimized model also showed high prediction performance in noise analysis. These findings highlight the importance of considering actual contact region uncertainty and demonstrate that the proposed framework can be an effective tool for improving the agreement between test and analysis.

RESEARCH INTERESTS

Optimization

INTERNATIONAL PUBLICATIONS (SCI Publication: 2, In preparation: 0)

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1. **S.M.Kim**, J.W.Choi, and J.J.Kim, “Personalized Stem Length Optimization in Hip Replacement: A Microscopic Perspective on Bone–Implant Interaction,” *Bioengineering*, vol. 11, no. 11, pp. 1074, 2024
 2. **S.M.Kim**, J.W.Choi, and J.J.Kim, “Rib Thickness Optimization of Vibration Test Fixture Based on Orthogonal Array for Weight Reduction,” *Mathematics*, vol. 14, no. 8, pp. 1269, 2026

DOMESTIC PUBLICATIONS (KCI Accepted: 1, In preparation: 0)

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1. **S.M.Kim**, J.J.Kim, “Optimization for 2-set Korean Keyboard Layout Based on Genetic Algorithm Considering Finger Fatigue,” *Journal of the Korea Academia-Industrial Cooperation Society*, vol. 25, no. 6, pp. 1-8, 2024

AWARDS

1. Excellence Award, KSMPE The Fall Academic Conference, 2025
2. Excellence Award, KAIS The Fall Academic Conference, 2025
3. Outstanding Paper Award, KSME Daegu-Gyeongbuk Branch Annual Conference, 2025
4. Excellence Award, 31st Student Research Paper Contest, Keimyung University, 2024

PATENTS (Registration KR: 1, US: 0, EU:)

1. 김정진, 김수민, “손가락 피로도를 고려한 유전 알고리즘 기반 한글 두벌식 키보드의 최적 배열”

INTERNATIONAL CONFERENCE

1. **S.M.Kim** and, J.J. Kim, “Genetic Algorithm–Based Optimization of Contact Regions for Improving Frequency Response Correlation,” Asian Congress of Structural and Multidisciplinary Optimization 2026.

DOMESTIC CONFERENCE

1. 조립 특성을 고려한 구조물의 주파수 응답 기반 결합 영역 탐색법: 김수민, 이한규, 최영중, 김민수, 김정진 한국생산제조학회 춘계학술대회, 2026.
2. 주파수 응답 기반 유전 알고리즘을 활용한 접촉부 영역 탐색 가능성 검증: 김수민, 김원진, 안기용, 김정진 대한기계학회 창립 80주년 기념 학술대회, 2025.
3. 접촉 조건 불확실성 하에서의 주파수 응답 기반 접촉부 탐색 기법: 김수민, 안기용, 김원진, 최해운, 김정진 한국기계항공학회 추계학술대회, 2025.
4. 직교배열을 활용한 리브 타입 진동 시험용 지그의 최적 두께 결정법: 김수민, 이순근, 김정진 한국산학기술학회 추계학술대회, 2025.
5. 주파수 응답 적합성을 활용한 접촉부 예측 기법 연구: 김수민, 김원진, 김정진 대한기계학회 대경지부 추계학술대회, 2025.
6. 유전 알고리즘을 이용한 격자 모델 기반 진동 시험용 지그 위상최적설계: 최준원, 백지아, 김수민, 김정진 한국기계항공학회 학술대회, 2024.
7. 골 미세구조의 응력을 고려한 인공 고관절 스템 길이 최적화: 김수민, 이한규, 김정진 대한기계학회 학술대회, 2024.
8. 최적설계 기반 차량 헤드램프용 리브형 지그의 고유진동수 회피 및 경량화: 백종혁, 김수민, 강지혜, 김정진 한국CDE학회 동계학술대회, 2024.

GRANTS AND CONTRACTS (PI: 0, CI:0, RA: 3)

1. RA: “구조해석 기반 3차원 테리안 프레임의 성능 평가 및 구조 최적화, 09/2024 ~ 12/2024, 30,000,000KRW
2. RA: “진동/충격 지그 최적설계 자동화 프로그램 개발,” ㈜ 에스엘, 03/2024~12/2024, 77,000,000KRW
3. RA: “고유진동수 회피 및 경량화를 위한 시험용 지그 최적설계,” ㈜ 에스엘, 05/2023~12/2023, 49,500,000KRW

