CURRICULUM VITAE

Name Nao-Aki NODA

Date of Birth December 25, 1956.

Current Affiliation
Professor Emeritus, Kyushu Institute of Technology

Home address
1-2-37, Kawanaka-yutaka-machi, Shimonoseki-city, Yamaguchi-prefecture, 751-0853 Japan.

Phone number home tel: 81-83-254-4030 cellphone 81-80-3886-6069

Email address nao592noda@gmail.com

Educational Background:
1979 BA Mechanical Engineering Dept., Kyushu Institute of Technology,
1981 ME Mechanical Engineering Dept., Kyushu Institute of Technology
1984 Ph.D. Mechanical Engineering Dept., Kyushu University

Professional Positions:
1984-1987 Assistant Professor Kyushu Institute of Technology,
1987-2003 Associate Professor, Kyushu Institute of Technology,
2003-2022 Professor, Kyushu Institute of Technology,
2022-Present Professor Emeritus, Kyushu Institute of Technology

Field of Specialization:
Stress Analysis, Strength of Materials, Elasticity, Fracture, Material Engineering,

Achievements and Highlights of Past Research Activities:

1) Nao-Aki Noda analyzed the stress concentration factors (SCFs) for notched test specimens by using the body force method. Then, he proposed the SCF formulas within 1% error in their papers and books “Theory of Fatigue Notch Strength Useful for Machine Design”. The formulas provide SCFs under arbitrary dimension of the notch including blunt and sharp notches and shallow and deep notches in the specimens. Also, he rigorously solved several singular integral equations and obtained the exact variation of the stress intensity factors of a semi-elliptical surface crack. For those achievements related to stress analysis, he received JSMS Academic Contribution Award.

2) In joint research with Hitachi Metals, Ltd., they first started developing all ceramic rolls for use in continuous galvanizing lines (CGLs) supported by a METI-funded project. He contributed by clarifying methods for reducing tensile stress during immersion in molten metal and during operation. Regarding the development of all ceramic roll, the academic-industrial collaboration group received Sokeizai Industry Technology award from Materials Process Technology Center Japan. Shrink-fitting was found to be essential for the joint of such ceramic rolls, but on the other hand, the shaft slipped out during operation. He realized this new phenomenon in the numerical experiments and clarified that irreversible local slip accumulation causes the failure. Regarding this achievement, Nao-Aki Noda received and JSDE Best Paper Award from Japan Society for Design Engineering.

3) Regarding rolling rolls, he investigated the relationship between heat treatment and residual stress through joint research with two roll manufacturing companies. In line with the actual situation, creep deformation was also incorporated into the analysis. As an example, a non-uniform heat quenching method, in which the inside of the roll is quenched at a temperature below the surface temperature, was found to be useful compared to the normal quenching after uniformly heating the entire roll. This is because the failure risk at the roll center risk can be reduced by providing smaller tensile residual stress at the roll center. Using the obtained residual stress as the initial condition, they analyzed the stress during rolling for the first time, clarifying the critical regions at the HSS/DCI boundary of the centrifugally cast bimetallic roll, and evaluated the fatigue strength of the roll. Recently he summarized such academic achievement in his book entitled

"Manufacturing innovation through industry-academia collaboration: The key to success learned from case studies". Regarding those collaborations, Nao-Aki Noda received JSMS Branch Distinguished Service Award.

4) There is an idea to shift the structure of rolling rolls to a sleeve assembly type. This kind of roll is a candidate to satisfy the requirements beyond the limits of current rolls as well as to reduce costs. On the other hand, even if the sleeve roll is designed so that it does not slip during rolling, there is a phenomenon in which the sleeve slips in the circumferential direction. This sleeve slip cannot have been explained by the conventional design criteria (driving torque < frictional resistance torque). Therefore, his group verified this by numerical experiments using load shifting method, and simulated experiments using miniature rolls. They clarified the process of damage on the inner surface of the sleeve. They confirmed the interfacial slip occurs even under free rolling conditions (driving torque 0) by analysis and experiment. The amount of slip increases with increasing drive torque, and a particularly large amount of slip occurs during rolling troubles. Regarding those academic-industrial collaborations, Nao-Aki Noda received JSME Materials & Mechanics Division Award, Contribution Award.

5) Nao-Aki Noda also studied several fastening elements. In the double screw project, he considered the loosening of nuts and the fatigue strength of bolts through joint research with Professor Nishida, Professor Takemasu, and Daiki Kogyo Co., Ltd. Supported by an academic-industrial collaboration METI-fund, the group received Japan Society for Technology of Plasticity JSTP Best Paper Award. After that, Noda et al showed that by giving an appropriate pitch difference to a single nut and bolt, it is possible to prevent loosening and improve strength with low cost. Regarding such academic-industrial collaboration with international PhD students, Nao-Aki Noda's group received JSTP Education Awards.

6) Nao-Aki Noda found that the adhesive strength can be expressed as a constant value of ISSF (Intensity of Singular Stress Field). He proposed a desirable specimen geometry of lap joint, which is not affected by bending deformation. He clarified the ISSF under pull out test and microbond test used to estimate fiber bonded strength in fiber reinforced composites. Recently he summarized such academic achievement in his book entitled "Fracture Mechanics for the Design of Bonded Dissimilar Materials and Structures". Regarding the achievement, he received JCOM Award for Scientific Papers from Japan Society of Materials Science. Regarding a series of pioneering research on strength design in adhesive, joining and fastening, he received JSME Materials & Mechanics Division Award, Achievement Award.

7) Nao-Aki Noda supervised more than 28 PhD students including 18 international students most of whom are supported by MEXT. He also supervised more than 30 international master students most of whom are working in Japanese companies. He invited more than 25 international researchers to Kyushu Tech for collaboration. For contributing to the development of excellent international students and foreign researchers, he received the Commendation of Consulate-General of China in Fukuoka.

Academic Awards Received:

1. JSMS Branch Distinguished Service Award, the Japan Society of Materials Science, 2023.5.29.
2..JSME Materials and Mechanics Division Award, Achievement Award, the Japan Society of Mechanical Engineers, 2022.09.27.
3. JCOM Award for Scientific Papers, Japan Society of Materials Science, 2020.08.04
4. Japan Society for Technology of Plasticity JSTP Education Award, 2020.06.12
5. Japan Society for Design Engineering Best Paper Award, 2020.05.23
6. JSME Materials and Mechanics Division Award, Contribution Award, the Japan Society of Mechanical Engineers, 2017.10.8.
7. Commendation of Consulate-General of China in Fukuoka, 2016.07.13
8. Fellow of the Japan Society for Automotive Engineers, 2015.06.12.
9. Fellow of the Japan Society of Mechanical Engineers, 2012.01.18.
10. Sokeizai Industry Technology Award, the Materials Process Technology Center, 2010.11.12.
11. JSMS Award for Academic Contribution, the Japan Society of Material Science, 2010.05.22.
12. JSTP Medal for Outstanding Paper, the Japan Society of Technology of Plasticity, 2008.05.23.

Academic-Industrial Collaboration METI-Funded Project

1. Development of Sanitary Gasketless Flange and its Clamping Device, Offer organization: Ministry of Economy and Trade and Industry, 2002.06-2003.03
2. Study on Anti-loosening Bolt Fastenings Based on Double-Screw Mechanism Offer organization: Ministry of Economy, Trade and Industry, 2002.10-2004.03
3. Ecological Manufacturing Innovative Method of Permanent Magnet Motor Core, Offer organization: Ministry of Economy, Trade and Industry, 2006.09- 2007.03

4. Development of Novel Ceramics Roll for High Quality Plating of Automobile Steel Sheets, Offer organization: Ministry of Economy, Trade and Industry, 2008.08-2010.03; Partially offered by Kyushu Industrial Technology Center, 2006.06-2007.03

5. Development of Nano Bubble Generator Using Honeycomb Structure for Long-Term Storage of Fresh Seafood, Offer organization: Ministry of Economy, Trade and Industry, 2014.10-2018.03

Research Achievement (Book)

1.Manufacturing innovation through industry-academia collaboration: The key to success learned from case studies, Agune Publication, 2023.12, Shin-Ichi Nishida, Hiroyuki Tanaka, Nao-Aki Noda,

2. Fracture Mechanics for the Design of Bonded Dissimilar Materials and Structures; Nao-Aki Noda, Kazuhiro Oda, Yasushi Takase, Genji Hotta, Corona Publication. 2023.11

3. Mechanics of Material Focusing on Equilibrium, Corona Publication, 2022.04, Nao-Aki Noda, Kazuhiro Oda, Rei Takaki

4.Adhesion/Bonding Control Factors and Optimization Technology, S&T Publication, 2021.02

5.Bonding Method of Dissimilar Materials, Science & Technology, 2017.07.

6.Mechanics and Stress Concentration for Bonded Dissimilar Materials, Corona Publishing Co. Ltd., 2017.05, Nao-Aki Noda, Genji Hotta, Yoshikazu Sano, Yusushi Takase.

7.Advances in finite element analysis for computational mechanics. 2015.02, SAGE publishing, Magd Abdel Wahab, Nao-Aki Noda et al.

8. Engineering Mechanics Focusing on Equilibrium, Corona Publication, 2011.07, Nao-Aki Noda, Genji Hotta.

9. Theory of Fatigue Notch Strength Useful for Machine Design, Nikkan Kogyo Shinbun, 2010.07, Nao-Aki Noda, Yasushi Takase.

10. Theory of Elasticity Useful for Machine Design, Nikkan Kogyo Shinbun, 2008.09, Nao-Aki Noda

11. Q&A: Risk Based Machine Design, Nikkan Kogyo Shinbun, 2006.03, Genzi Hotta, Nao-Aki Noda

12. Safety Engineering Useful for Workers in Industry, Japan Institute of Plant Maintenance, 2003.08, Nao-Aki Noda, Genzi Hotta

13.Stress Intensity Factors Handbook Vol.4 & Vol.5, Elsevier & Society of Materials Science Japan, 2001.07, Nao-Aki Noda, et al.

14. Mechanical Engineering Dictionary, Rikogakusha, 1996.08.

Published papers.

https://nao3886noda.sakura.ne.jp/thesis/thesis.html (all papers are indicated in list of publication)

https://www.researchgate.net/profile/Nao-Aki-Noda (More than 580 articles)

https://www.scopus.com/results/authorNamesList.uri?st1=NODA&st2=NAOAKI&origin=searchauthorlookup (Scopus ID 7202782903, More than 323 articles, more than 413 records)

https://scholar.google.com/scholar?start=0&q=na+noda&hl=ja&as_sdt=0,5

https://orcid.org/0000-0001-8469-3577

Papers published in two years after the retirement of Kyushu Tech

1. Analysis method useful for calculating various interface stress intensity factors efficiently by using a proportional stress field of a single reference solution modeling (2024・Archive of Applied Mechanic (in press)（Kazuhiro Oda, Shunsuke Ashikari and Nao-Aki Noda）

2. SIF formula based on exact SIF distribution for semi-elliptical surface cracks subjected to mode I, II, III uniform loading (2024・Fatigue & Fracture of Engineering Materials & Structures (in press)（Yashushi Takase, Nao-Aki Noda

3. Rigorous SIF-based prediction of fatigue life improvement for prestressed-CFRP-repaired cracked steel plates (2023・Ocean Engineering, Vol.288（116135））（Yu Zhang, Feifan Zhang, Zhansheng Guo and Nao-Aki Noda）

4. Residual stress simulation for bimetallic sleeve roll constructed by shrink-fitting in comparison with bimetallic solid roll (2023・Journal of Manufacturing Processes, Vol.107（252-267））（Mohd Radzi Aridi, Rahimah Abdul Rafar, Nao Aki Noda et al）

5. Novel anti-loosening nut designed to have large and stable loosening resistance torque（2023-5・Journal of Mechanical Science and Technology, Vol.37（2461-2469））（Evgeniia Shchelkanova, Xi Liu and Nao-Aki Noda）

6. ISSF method to evaluate adhesive strength when two distinct singular stress fields appear along the interface (2023・International Journal of Fracture, Vol.24（95-114））（Nao-Aki Noda, Rei Takaki, Yoshikazu Sano and Biao Wang）

7. Thermal stress intensity factor of an edge interface crack under arbitrary material combination considering double singular stress fields before and after cracking (2023・Acta Mechanica, Vol.234（3037-3059））（Kazuhiro Oda, Takayuki Shinmoto and Nao-Aki Noda）

8. Semi-automatic retractable handrail utilizing opening/closing movement of sliding door supporting elderly people to walk independently: Strength analysis of sliding door and experimental verification (2023・Mechanics Based Design of Structures and Machines（1-26））（Kinjirou Saitou, Nao-Aki Noda, et al）

9. Fatigue strength analysis of bimetallic sleeve roll by simulation of local slip accumulation at shrink-fitted interface caused by roll rotation (2023・International Journal of Advanced Manufacturing Technology, Vol.125（369-385））（Nao-Aki Noda, Rahimah Abdul Rafar et al

10. Fatigue strength improvement in roller chain due to press fitting between pin and outer plate and between bush and inner plate (2023・International Journal of Fatigue, Vol.168（107451））（Ryoichi Saito, Nao-Aki Noda, Yoshikazu Sano, Arata Miyagi and Hisanori Tottori）

11. Residual stress simulation for bimetallic sleeve roll constructed by shrink-fitting in comparison with bimetallic solid roll (2023・Journal of Manufacturing Processes, Vol.107 (252-267))(Mohd Radzi Aridi, Rahimah Abdul Rafar, Nao-Aki Noda et al)

12. Anti-loosening mechanism of pitch difference bolt nut connections based on Junker loosening test (2022・Mechanics Based Design of Structures and Machines（1-23））（Nao-Aki Noda, Biao Wang et al）

13. Interfacial slip verification and slip defect identification in shrink-fitted bimetallic sleeve roll used in hot rolling mill (2022・Tribology International，Vol.175（107793））（Nao-Aki Noda, Rahimah Abdul Rafar, Yudai Taruya, Xuchen Zheng, Hiroyuki Tsurumaru, Yoshikazu Sano, Yasushi Takase, Ko Nakagawa and Keisuke Kondo）

14. Cohesive failure verification and fracture origin identification when the adhesive strength is expressed as a constant ISSF (2022・International Journal of Adhesion and Adhesives, Vol.116, 103148））（Rei Takaki, Nao-Aki Noda et al）

15. Semi-automatic retractable handrail utilising opening/closing movement of sliding door supporting elderly people to walk independently: proposed and satisfied design specifications for elderly people (2022・Journal of Medical Engineering & Technology（1-19））（Kinjirou Saitou, Nao-Aki Noda, et al）

16. Novel design concept for shrink-fitted bimetallic sleeve roll in hot rolling mill (2022・International Journal of Advanced Manufacturing Technology, Vol.120, 3167-3180））（Rahimah Abdul Rafar, Nao-Aki Noda, et al）

17. Identification of driving out force of shaft towards preventing coming out failure of shaft in shrink-fitted ceramic sleeve roll (2022・Engineering Failure Analysis, Vol.135 (106155）（Guowei Zhang, Nao-Aki Noda, Yoshikazu Sano and Yasushi Takase）

18. Fatigue failure analysis for bimetallic work roll in hot strip mills (2022・Steel Research International, Vol.93 (2100313))（Mohd Radzi Aridi, Nao-Aki Noda et al）

19. Fatigue failure risk evaluation of bimetallic rolls in four-high hot rolling mills (2022・Fatigue and Fracture of Engineering Materials and Structures, Vol.45(1065-1087))（Mohd Radzi Aridi, Nao-Aki Noda, et al）

20. Reference solution and proportional method to calculate intensity of singular stress field (ISSF) at the interface corner where reinforced fiber enters resin matrix（2022・Mechanics of Advanced Materials and Structures, Vol.29 (2962-2972))（Nao-Aki Noda, Dong Chen and Yoshikazu Sano)

21. Prevailing torque and residual prevailing torque of Bolt-Nut connections having slight pitch difference（2022・Mechanics Based Design of Structures and Machines (Vol.50 (2032-2045))（Nao-Aki Noda, Xi Liu, et al)