



September 30, 2019

To Whom It May Concern:

I have had the pleasure of advising Dr. Ahmed Elmekawy as his doctoral dissertation director. (Attached please find my brief CV). I am writing in support of his application to the Radcliffe Institute Fellowship Program. I am confident that he will be able to successfully conduct his proposed research titled "*Assessment, Optimization, and Control of Oscillating Water Column in Egypt*" submitted for your organization. To support my view, I will briefly mention his experience as a researcher.

Dr. Elmekawy is a successful researcher with deep understanding of at least two application areas in CFD (air flow, vortex dominated flows and turbulent reacting flow) and structural modeling (using finite element analysis). It is rare to find a young researcher that has been able to achieve significant results in more than one field.

Dr. Elmekawy conducts research in applications of computational fluid dynamics (CFD) and finite element analysis techniques. His computational and programming skills have allowed him to work on some of the most challenging problems in fluid-structure interaction simulations. For instance, he has done extensive work on such interactions, where there is strong interplay between turbulent flow and an oscillating structure. These complex non-linear interactions are governed by non-linear governing equations that require special care at the model level and the selection of the appropriate numerical techniques.

Dr. Elmekawy contributed to the body of research in modeling and simulation of aerodynamics, vibrations, and aeroelasticity of a fighter jet in flight. He was able to apply novel non-linear eddy viscosity turbulence models to understand the characteristics of the vortex interaction with the fighter tail. He was able to publish his doctoral dissertation in the American Institute of Aerospace and Astronautics (AIAA) conference and *Journal of Aircraft*.

Dr. Elmekawy combines a sound understanding of the underlying physics of complicated fluid flows by using computational techniques coded in advanced commercial software. He was able to achieve better results than prior publications. He demonstrated the practical guidelines for modelers and designers regarding the choice of the most appropriate turbulence modeling strategy for a given flow based on cost and accuracy tradeoffs.

Sincerely,

A handwritten signature in blue ink, appearing to read "Oktay Baysal".

Oktay Baysal, Ph.D., P.E., Fellow, ASME
Professor, Eminent Scholar and Former Dean

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FLEXIBLE STEEL LACING COMPANY

Gregory Westphall
1995 Oak Industrial Drive N.E.
Grand Rapids, MI 49505
September 13, 2019

To whom it may concern,

I have known Ahmed Elmekawy since May of 2012 where he was under my direct supervision until June 2015, and from June – September 2019. In that time period he took on a number of engineering assignments and performed them accurately and professionally. He prepared written reports of his work and presented his work in formal presentations to both his peers and senior management.

I have personally observed Ahmed demonstrate his ability to leverage a variety of engineering principles for problem solving such as kinematics, heat transfer, fluid dynamics, mathematical optimization, programming, stress calculation, cam path generation, and failure theory. He has also mentored and directed the activities of multiple summer interns to assist him in his work. He is well rounded and quite capable.

Ahmed's early work centered on solving the problem of attaching a highly specialized connector used to splice heavy duty mining conveyor belts. The connector used proprietary rivets as a connecting means. Improving the installation method has been a huge challenge for our organization. Ahmed's approach gave Flexco an opportunity to have a breakthrough method using hydraulics that may resulted in U.S. Patent # 10,228,043 B2. Ahmed also worked on determining failure modes and calculating stresses for a series of complex splice installation machines. The machines used a variety of mechanisms to transmit forces including 4-bar linkages, roller cam paths and hydraulic pressure. His input during design reviews was been very beneficial to the success of the project. This past summer, Ahmed was brought onboard to Flexco for a temporary assignment. He assisted in moving a project forward that had stalled. He jumped in mid-stream, collaborated with existing staff and was able to discern where the roadblocks were. His final output provided sound recommendations for future specification changes as well as improved testing methods for a critical part in our hinged splice.

I continue to be very impressed with Ahmed's nature and work ethic. He is inquisitive and tries very hard to contribute to the organization. He is well respected and liked by his peers. He raises the appropriate concerns in a professional manner. He has been helpful in suggesting approaches to problem solving that were not originally considered. His report writing skills are quite good and he is able to convey complex problems in a manner in which his peers can understand. He has earned trust and continues to take on more responsibility. He is a fine engineer and is a credit to the engineering profession.

Respectfully Submitted


Gregory L. Westphall, P.E. IL. 062.056375
Director of Engineering, Flexco, Grand Rapids, MI

FLEXCO



March 25th, 2019

Letter of Recommendation for Ahmed Mohamed Nagib Elmekawy

Dear EYAS Candidates Selection Committee,

I am delighted to be called upon to recommend Ahmed Mohamed Nagib Elmekawy to be selected as a member of Egyptian Young Academy of Science (EYAS). I have known Ahmed for four years as his department head. Ahmed is an Assistant Professor in Mechanical Engineering Department at Faculty of Engineering – Alexandria University. Ahmed is one of the outstanding Faculty members in our department.

Ahmed has supervised many student teams which participated in international competitions such as ROV (Remotely Underwater Operated Vehicles) in USA, ASME HPVC (Human Powered Vehicle Competition) in USA, SAE RC Aircraft Competition in USA and IRC (International Robotics Competition) in India. His teams got outstanding ranking in those competition as follows: ROV Teams were ranked 1st and 3rd of 28 teams at International ROV Competition at Seattle, USA, 2018. IRC team was ranked 4th of 32 teams at India, 2015.

Ahmed is one of the best lecturers in the department. He has great presentation skills and introduce practical examples from the industry in his courses based on his work as a consultant. He is also well-recognized by his peer group and teammates to be organized, reliable, works well under pressure and successful.

Ahmed has an outstanding publication record as e published one US patent, two papers in international conference and one Journal paper.

Ahmed also is one of the best trainers at our Faculty Engineering Center as he worked as an instructor for an over 20 training courses for students and graduates such as Robotics For Kids, SolidWorks Essentials, Introduction to Vibration Analysis, Vibration Analysis – Category I and Category II, Fits, tolerances and Measurement and Drawing Interpretation.

Ahmed is a good team leader as he organized several events in our departments such as CFD workshop, Space Exploration Seminar, Several Sport Tournaments in Soccer for our department (more than 320 students participated in one of those competitions), Research and Development Seminar. Ahmed also is the leader of the team preparing for our Department Accreditation from the Egyptian National Authority for Quality Assurance and Accreditation of Education in November 2019.

Overall, Ahmed is highly intelligent, ambitious and has good analytical skills. Ahmed also performed several consulting jobs for our Faculty Engineering center in several Fields such as HVAC, Firefighting, Elevators, Hydraulic pipe line design and Vibration fault diagnosis. His repetition as an outstanding consultant increases with time.

I evaluate Ahmed Mohamed Nagib Elmekawy as one of our finest, most well-rounded Assistant Professors who is ready to achieve his goals. I am positive that Ahmed would be a tremendous asset to your organization and I highly recommend him to you without reservation. If you have any further questions regarding his background or qualifications, please do not hesitate to contact me.

Sincerely,

 28 - 3 - 2019

Professor: Wael M. El-Maghlany
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April 13, 2015

USCIS
Attn: I-140
P.O. Box 660128
Dallas, TX 75266

Re: Recommendation letter for Dr. Ahmed Elmekawy Petition (EB-2 National Interest Waiver)

Dear USCIS Officer:

I find it a distinct pleasure to support Dr. Elmekawy's petition for Permanent Residency in the United States of America in category EB-2 National Interest Waiver.

If deemed of interest, my personal background embodies the better part of 3 decades of mechanical R&D/New Product Development. Following attainment of my undergraduate degree at University of Illinois in Mechanical Engineering I was instrumental in developing many unique new products as illustrated by patents awarded (US8539625, US8540609, US8092348, US8021276, US7771324, US7625317, US7594877, US7479093, US7137876). I subsequently completed my Master's degree in Business Administration and pursued a career in management.

While managing the New Product Development department at Flexco the need for a highly skilled individual in the realm of computational fluid dynamics for hydraulic machinery design was paramount to our success. During the course of a lengthy candidate search I was fortunate to make the acquaintance of Dr. Elmekawy who had distinguished himself from all other applicants with his doctoral thesis on fluid/structure interaction. Shortly after his acceptance of our employment offer it became obvious his resume did not do him justice, Dr. Elmekawy within a few short months fully defined, predicted, and made appropriate recommendations responsible for the success of several novel hydraulic projects, some patent pending.

Consequently, Dr. Elmekawy is responsible for advancing the state of the art in pneumatic and hydraulic technology in the flexible steel lacing industry. His analysis, conclusions, and recommendations are credited for the successful development of the pneumatic rivet driver and the 5@time hydraulic rivet driver.



It is clear and obvious that the level of contribution Dr. Elemekawy has provided and is expected to continue to provide will further promote advances in material conveying sciences. Flexco's global competitive advantage would be severely hampered without Dr. Elmekawy's key contributions, which is why I truly believe permanent U.S. residency is in our nation's best interest, individuals of his caliber are rare indeed.

For the above reasons, I strongly support and recommend granting Dr. Ahmed Elmekawy Permanent Residency in the United States of America.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Immordino".

Joseph Immordino
Director of Engineering

February 15, 2015

To whom it may concern,

I am indeed pleased to recommend one of my talented students Dr. Ahmed Elmekawy for an engineering position at your company.

In recommending him to this particular position, I understand that it requires excellent experience in solving mechanical design problems and enormous hard work, to which Dr. Elmekawy is well accustomed to. In my close acquaintance with him for 3 years, I have formed a positive image about him. This evaluation is based on Ahmed's Master thesis and his work as a lecturer assistant with me. At this point I would like to mention his contribution in his Master thesis "Effect of magnetic bearings in rotor dynamics" where he showed the right ability to evaluate previous literature review and generate outstanding research. Ahmed showed excellent performance in applying theoretical knowledge in statics, mechanics of materials, kinematics and mechanical vibration to solve mechanical design problems. Ahmed proved his capabilities in programming for finite element analysis problems by using Matlab. During his assignment as a lecturer assistant with me in the three courses *Mechanical Drawing I and II, Theory of Machines* in each of which he was one of the prominent lecturer. His teaching skills and understanding of the subjects were evident from his student's results and evaluations. I have come to believe that he has significantly through concepts in his undergraduate and graduate studies owing to which he can gather concepts quickly and at the same time be able to apply them in practical situations.

All in all, I think Dr. Elmekawy has the right level of skill and experience as an Engineer and persistence required to obtain a successful career. I am sure he will prove an asset to your organization, and I strongly recommend him for joining your organization.



Hussein Metwally

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