



THE UNIVERSITY OF BRITISH COLUMBIA
Okanagan Campus

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Funded PhD Position Available

PhD student in Computational Fluid Dynamics of Indoor Airborne Disease Transmission

Description

Applications are requested for a **fully-funded** PhD position in computational fluid dynamics (CFD) of aerosol-based disease transmission in indoor environments. The research will be conducted within the [UBC Cluster of Research Excellence in Airborne Disease Transmission](#), a cross-campus team of researchers developing infection isolation and removal solutions designed to mitigate the transmission of COVID-19 and other airborne illnesses in healthcare settings. Working in close collaboration with partners in diverse clinical settings, this expert team of researchers aims to break the transmission of respiratory infections to make healthcare delivery safer. The successful applicant will work in a multidisciplinary team alongside experts in computational fluid dynamics, multiphase flows, immunology, assistive health technology, dentistry, public health, epidemiology, surgery and anesthesiology.

The successful applicant will investigate how the design of indoor spaces, their ventilation and infection control systems, and the actions of human occupants in and through these spaces impact the transport of air and airborne droplets and aerosols. The research will be jointly supervised by Dr. [Joshua Brinkerhoff](#) and Dr. [Vicki Komisar](#), both in the [UBC Okanagan School of Engineering](#). The specific research activities will involve high-fidelity multiphase large eddy simulations (LES) of droplet- and aerosol-laden flows in indoor environments. High-risk clinical activities will be identified by clinical partners, and the LES studies will characterize the transport behaviour of air and aerosols within the corresponding spaces, including all relevant factors affecting airflow (furniture/equipment layout, local and distributed heat sources, ventilation flows, and occupants). The simulations will help identify how air moves through a space, how aerosols are transported and deposited, and how the room design, location of equipment, the types of medical procedures performed in the various rooms, and the room ventilation performance affect airborne disease transmission. The research will also investigate how healthcare workers and patients moving within the space impact infection transmission.

The position is open to students who have completed a Masters degree in mechanical, civil, biomechanical, or aerospace engineering or a related discipline. Applicants with interests in fluid mechanics, computational fluid mechanics (CFD), numerical simulation, parallel computing, and biomechanics are encouraged to apply. Coding experience in Python/C/C++/OpenFOAM and prior CFD experience is an asset, as is strong skills in CAD software and meshing tool for CFD, large-scale parallel computing, large eddy simulations (LES), turbulence, and/or health research.

This opportunity is available to Canadian citizens, permanent residents of Canada, and international applicants meeting the admission criteria for UBC Okanagan and School of Engineering. It is expected that successful candidates will commence graduate studies from September 1, 2021, or as soon as possible thereafter.

Application procedure

Candidates are asked to submit:

- A cover letter describing their research interests, experience, and motivations for graduate study
- A detailed curriculum vitae highlighting their educational and professional achievements
- A list of three professional and/or academic references
- Unofficial transcripts from their Masters degree
- English test scores (if required). Applicants with degrees in a language other than English must have a minimum TOEFL score of 580 (PBT) or 92 (IBT) or IELTS minimum overall band of 6.5 (with nothing less than 6.0 per individual test)

Interested candidates should send the above documents and direct queries to Dr. Joshua Brinkerhoff (joshua.brinkerhoff@ubc.ca). Additional information of Dr. Brinkerhoff's research is available from his research webpage: <https://cfdlab.ok.ubc.ca/>.

Equity and diversity are essential to academic excellence. An open and diverse research team fosters the inclusion of voices that have been underrepresented or discouraged. Equity and diversity not only lead to a more fair and open society, but also improves the quality of the science and increases the opportunities to learn and grow from each other. Drs. Brinkerhoff and Komisar specifically encourage applications from members of groups that have been marginalized on any grounds enumerated under the B.C. Human Rights Code, including sex, sexual orientation, gender identity or expression, racialization, disability, political belief, religion, marital or family status, age, and/or status as a First Nation, Metis, Inuit, or Indigenous person.