

# Novel online training for firefighters beats back residential fires, cardiovascular risk

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Findings from the New York Fire Department's tests on buildings on Governors Island will become part of the NYU Fire Research ALIVE training segment on residential fires. NYU researchers are working with major urban fire departments to build new knowledge on modern residential firefighting into free, game-based online training simulations with an engaging, dynamic format. A grant from the US Department of Homeland Security will also fund development of mobile applications and a module aimed at preventing sudden cardiovascular events among firefighters. Credit: New York Fire Department

Firefighting isn't what it used to be. Whether it's a complex blaze raging in an urban high-rise or a seemingly straightforward single-level home fire, modern building construction and furnishings have made fighting fires more difficult: Flames burn hotter, produce more smoke, and spread more quickly.

But [fire](#) research has advanced, too, and a team from New York University Tandon School of Engineering is working with five major urban fire departments to build new knowledge on modern residential firefighting into game-based online simulations with an engaging, dynamic format.

Like previous [training](#) modules developed by the NYU Tandon Fire Research Group, the free interactive training will quickly and widely disperse accurate information to departments across the country.

The residential-fire module is funded by a two-year, \$1.5 million grant from the Assistance to Firefighters Grant (AFG) program of the U.S. Department of Homeland Security. The grant will also fund development of mobile applications and a module aimed at preventing the leading cause of line-of-duty deaths among firefighters: sudden cardiovascular events.

Helping to develop the residential-fire training module are the New York Fire Department, Chicago Fire Department, Los Angeles County Fire Department, Houston Fire Department, and Bloomington (Minnesota) Fire Department, as well as experts from the Underwriters Laboratory (UL).

Residential fires will be the next training module in a system called ALIVE, created by the NYU Tandon Fire Research Group under the leadership of Mechanical Engineering Professor Sunil Kumar. ALIVE, which stands for Advanced Learning through Integrated Visual

Environments, is a research-based online interactive training program. The new offerings will join sessions on fire dynamics, fighting fires in buildings constructed using modern lightweight materials, and training for urban high rises in which wind is a particular risk.

More than 50,000 firefighters from all 50 states have used previous training modules developed for ALIVE, and the program has been adopted by more than 800 fire departments.

"ALIVE is an efficient, effective way to share crucial information among our nation's firefighters, a majority of whom are part-time or volunteer and lack the time and resources to seek additional training," said Prabodh Panindre, an NYU senior research scientist. "Research shows that using ALIVE, which has an engaging, game-like format, helps firefighters retain the critical safety information taught in trainings, and we're grateful to have the opportunity to expand the program offerings," said Richard Elliot Wener, a professor of environmental psychology in the Department of Technology, Culture and Society at NYU Tandon.

"The ALIVE training has allowed our firefighters to benefit from recent research on subjects in the fire service," said Ulysses Seal, chief of the Bloomington Fire Department. "Without this online training, dissemination of this knowledge would be delayed, as we would have to wait for outside instructors to bring the information to the department."

"Firefighters cannot train using live fire on a daily, weekly, or even a monthly basis—it's impractical and too costly," said Derek Alkonis, director of training for the Los Angeles County Fire Department.

"However, firefighters need to understand how fires behave in structures and how assessing fire, heat, smoke, and flow path can help them make better strategic and tactical decisions. Programs like ALIVE give us opportunities to make mistakes without having to suffer real-life

consequences."

The forthcoming health module will focus on minimizing cardiovascular risks caused in part by the combination of high stress, hostile temperatures and conditions, and heavy protective equipment. It will train firefighters to understand the physiological strains of firefighting duties, the factors that increase their risk of sudden cardiovascular events, and evidence-based measures that may lessen the likelihood of a cardiac event during or immediately following emergency operations.

To develop the cardiac health module, the NYU Tandon Fire Research Group is partnering with the fire departments in Bloomington, Chicago, and New York, along with experts from Skidmore College and the Illinois Fire Service.

The researchers plan to roll out the new ALIVE modules over two years.

Fire departments interested in ALIVE training may contact the NYU Fire Research Group at [fire.research@nyu.edu](mailto:fire.research@nyu.edu). More information is available at <http://engineering.nyu.edu/fire>.

Research on the effectiveness of ALIVE training was published in the February 2015 issue of Fire Safety Journal:  
<http://www.sciencedirect.com/science/article/pii/S0379711215000156>.

Four ways that firefighting has changed:

- Open floorplans can allow fire to spread more quickly
- Synthetic materials in furniture and carpeting can fuel fires
- Lightweight construction methods require fewer beams and support members, so walls, ceilings and roofs can collapse more quickly
- Advances in fire dynamics research showed [firefighters](#) that

strategically placed fans can change the direction of a fire and that venting a fire may not cool it—but instead dramatically alter its direction

Provided by New York University

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