

IMFire – A system for Intelligent Management of Wildfires

IMFire (Intelligent Management of Wildfires) is a web-based platform for the simulation of wild fire propagation. It is designed for fire prevention, combat planning and serves as a forecasting system.



Why do yo need IMFire?

- Wild Fire Prevention: receive fire risk information to be prepared during droughts and heat waves
- Wild Fire Prediction: rely on reliable and quick forecasts for optimal combat planning
- **Combat Planning:** Develop efficient fire fighting strategies to save men power and resources

What does IMFire offer?

- Fire risk index: remind and warn local residents of fire risks
- Operational forecasting: figure out if you are at risk if a wild fire is approaching
- User friendly web-based platform: train your fire fighters



Who are our clients?

- Local authorities: consult IMFire for fire risk management and information of residents
- Fire fighters: use ImFire for efficient fire combat planning
- Land owners: take advantage of IMFire by developing wild fire prevention strategies
- Paper manufacturers: protect your forests from wild fire

menzio GmbH Zum Nordkai 16 D-26725 Emden

Mail: info@menzio.de Web: www.menzio.de

Phone: +49 (0) 4921 8018717 Ostfriesische Volksbank EG IBAN: DE66 2859 0075 4009 0566 00 **BIC: GENODEF1LER**

Managing Director: Jörg Fangmann HRB 204344 **District Court Aurich** Tax No.: 58/200/14541

D-26725 Emden

Web: www.menzio.de



District Court Aurich

Tax No.: 58/200/14541

IMFire – Prevention, Propagation Prediction, Combat Planning Forest Fires

 IMFire was developed by an international consortium of interdisciplinary specialists in wind field simulation (menzio GmbH), industrial aerodynamics (ADAi), safety and transport (Thales Group), fire suppression (CFisUC, University of Coimbra) and fire behaviour and risk (ISR, University of Coimbra).



BIC: GENODEF1LER



IMFire is a platform for the simulation of forest fire spread in complex terrain. As knowing the wind field is an important aspect in fire propagation simulations IMFire combines the CFD-Software WindStation of menzio GmbH and the fire model FireStation of ADAi.

Input Data

- Digital elevation model
- Vegetation and moisture maps
- fuel properties (particle size, fuel load, fuel depth as moisture contents)
- Wind speed and direction simulated by WindStation

Results

- Propagation map (Figure 1)
- Flame length
- Heat release rate
- Fire spread rate
- Fire line and depth intensity



Model Physics Rothermel's model

- (propagation speed)
- Ellipse type models (fire shape)
- Dijkstra's algorithm (fire growth)

The picture shows the results of a fire propagation simulation with IMFire. The black arrows show the direction of the wind field simulated by WindStation. The different colours visualise the fire propagation within one hour. A large are indicates, that the fire was propagating rapidly. The source of the fire is indicated by the white arrow

(Picture rights: ADAi).

References:

- Lopes et al., 2019: Simulation of forest fire spread using a two-way coupling algorithm and its application to a real wildfire, Journal of Wind Engineering & Industrial Aerodynamics 193 (2019) 103967.
- Ribeiro et al., 2014: The history of a large fire or how a series of events lead to 14000 Hectares burned in 3 days.
- Viegas et al., 2008: The Kornati fire accident –eruptive fire in relatively low fuel load herbaceous fuel conditions. Modelling, Monitoring and Management of Forest Fires I.
- Ribeiro et al. 2006: Operational Application of a Decision Support Tool in Fire Management in Portugal, EADC 2006 Proceedings.

menzio GmbH Zum Nordkai 16 D-26725 Emden

Mail: info@menzio.de Web: www.menzio.de

Phone: +49 (0) 4921 8018717 Ostfriesische Volksbank EG IBAN: DE66 2859 0075 4009 0566 00 **BIC: GENODEF1LER**

Managing Director: Jörg Fangmann HRB 204344 **District Court Aurich** Tax No.: 58/200/14541





Company Portrait

menzio GmbH

- Was founded in 2017 and unites a team of international experts in meteorology, geography, environmental sciences and engineering with more than 25 years of experience in technical and scientifical analysis and measurements for the energy industry and wind farm projects. We find an individual solution for your wind related problem!
- Offers with its CFD software package WindStation a professional tool for highly accurate wind flow simulations



Dipl.-Ing. Jörg Fangmann



Dipl.-Geogr. Herbert Koch



M. Sc. Climate Sc. Regina Daus



Prof. Dr. António Gameiro Lopes



mensio

Dr. Omar Herrera Sánchez

- Micrositing and site assessments of wind farms
- Services for offshore wind farms
- Site suitability and turbulence assessments
- Operation optimization of wind farms
- Noise and shadow flicker assessments
- Urban climate and flow obstacle analysis
- Cross wind analysis along railways
- Adaptive overhead line monitoring for grid operators
- Analysis of extreme (weather) events as storms, forest fires extreme temperatures due to climate change
- Propagation simulations for protection from and prevention of wild fires with IMFire

Contact us!

menzio GmbH | Zum Nordkai 16 | 26725 Emden

Phone: +49 4921 8018717 Web: www.menzio.de Mail: cfd@menzio.de