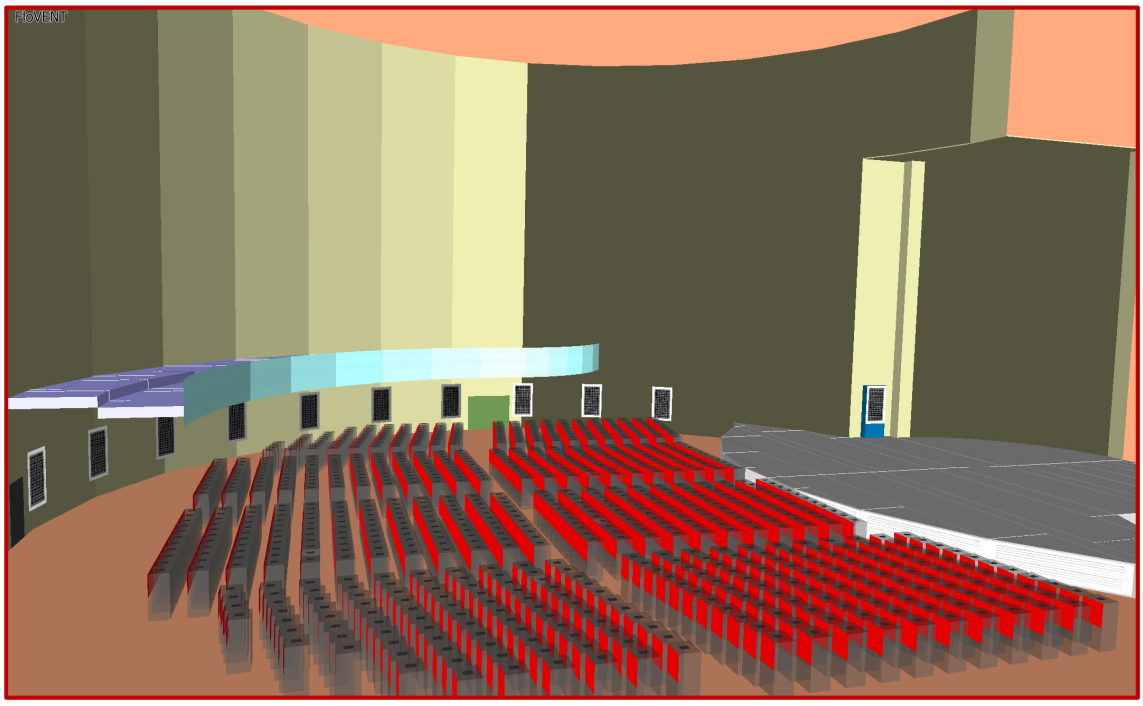
simultude

Thermal Fluid Modelling for the Building Industry



CAPABILITY STATEMENT

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Introduction

Simultude is a niche type Consulting Engineering practice which provides Computational Fluid Dynamics (CFD) modelling of building ventilation systems.

Simultude specialises in the simulation of air flow and heat transfer in all building HVAC applications. This includes the design of:

- Performance Based Car Parks
- DATA Centre Optimisation
- Natural Ventilation
- Thermal Comfort
- Air Change Effectiveness for Green Star
- Plume Dispersion

We also use CFD for detailed component design which reduces the need for prototyping, ultimately lowering the total cost of design. Since we specialise in CFD our services are cost effective, providing accurate simulations within the required time frame.

Company Overview

Simultude was conceived by PhD Engineer Dr Colin Allison by combining his experience of Consulting in the Heating, Ventilation and Air-Conditioning (HVAC) industry with his expertise in Computational Fluid Dynamics. Simultude has been providing a specialised consulting service to the building industry since 2009 and has been involved in many prestigious building developments in Australia and internationally.

We have various CFD codes at our disposal, depending on the application. For HVAC applications we use FloVENT:

- FloVENT is arguably the best CFD tool for optimising HVAC systems designs.
- Predicts the 3D air flow, heat transfer, contamination distribution and comfort indices in and around buildings.

For detailed component design we use FloEFD:

- FloEFD is extremely accurate and has been validated extensively using various performance benchmarks.
- Has partial cell technology which permits the use of a Cartesian mesh, even for curvilinear geometry.
- Automatically selects the laminar, transitional or turbulent flow regime as appropriate, and updates it while the solution progresses.

List of Products and Services

Simultude Provides CFD Modelling of Building Ventilation Systems:

Performance Based Car Parks

Where a code based design is impractical, Simultude uses CFD to prove compliance of an alternative solution. Or else where conservative code based air quantities can be reduced, so can capital equipment costs and energy consumption. Moreover spatial constraints can be overcome by using Jet Fans to induce fresh air and facilitate decent air mixing.

Data Centre Optimisation

This is realized by a virtual facility approach to modelling and following the cooling path in order to achieve optimum design objectives. The failure of critical equipment items can be simulated to explore various counteractive scenarios so as manage the risk of thermally induced downtime.

Natural Ventilation

Various novel natural ventilation concepts can be trialled efficiently by effective simulation. Examples include solar chimney design or wind towers etc. Working directly with Architects saves iteration effort and speeds up the design process. Pedestrian comfort levels can be monitored effectively without expensive wind tunnel testing.

Thermal Comfort

Various comfort metrics such as PMV and PPD can be easily plotted in order to quantify the effectiveness of the air conditioning design.

IEQ-2 credits for Green Star Accreditation

Simultude can ensure your building design achieves the IEQ-2 credits for air change effectiveness, required for a Green Star building project.

Plume Dispersion

Discharge stack and exhaust flue emissions and plume dispersion can be accurately simulated to ensure atmospheric contaminants are controlled to comply with health and safety guidelines.

Detailed Component Design

HVAC components such as diffusers, fans, louvers etc can be optimised to achieve performance benchmarks. Aerodynamic streamlining can be effortlessly achieved by using a virtual wind tunnel, eliminating costly prototyping or invasive testing.

Management Profile

Dr Colin Allison

Director of Consulting Services

Colin founded Simultude in 2009 as a vehicle to combine his extensive background in both CFD modelling and the HVAC industry.

Colin obtained his PhD in Mechanical Engineering at the University of Adelaide, where he performed many simulations to achieve the outcome. He has over 15 years' experience as an Engineering Consultant for various Building Services Consulting firms both locally and overseas.

Colin undertakes the CFD modelling for Simultude's clients and coordinates directly with them to ensure a successful outcome is realized.

Colin has been a member of AIRAH for 15 years and is a regular contributor to the Ecolibrium Journal. He has written many articles and papers on CFD modelling as applied to the HVAC industry.

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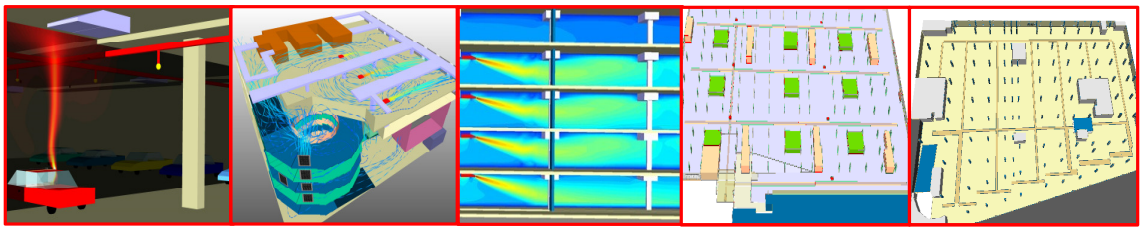
List of Clients by Category

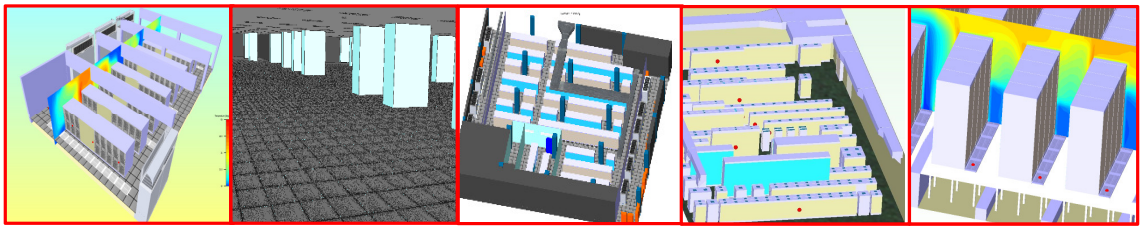
Performance Based Car Parks

Client and Project	Approximate Cost
MacCormak & Associates IKEA Car Park, VIC	$12 500
Waterman AHW Regent Car Park, QLD	$9 500
EMF Griffiths Winter Garden Car Park Ventilation, QLD	$15 000



DATA Centre Optimisation

EMF Griffiths ENERGEX DATA Centre, NSW	$5 000
Fujitsu DATA Centre, North Ryde, NSW	$11 000
Waterman AHW Broadway DATA Centre, NSW	$6 000



Natural Ventilation

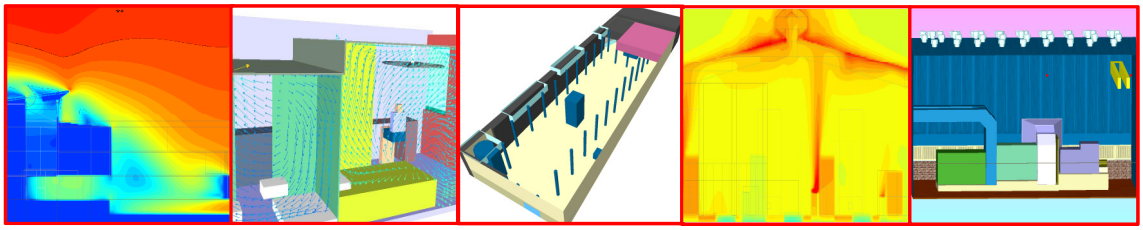
Irwin Consult $4 500
Palmerston Hospital, NT

Bayliss Consulting $9 000
DHL Welshpool Dangerous Goods Warehouse, WA

Waterman AHW $11 000
Barangaroo Exhibition Centre, NSW

Chevron Energy $9 000
Gorgon Project, Barrow Island, WA

Dubal Aluminium Smelters $15 000



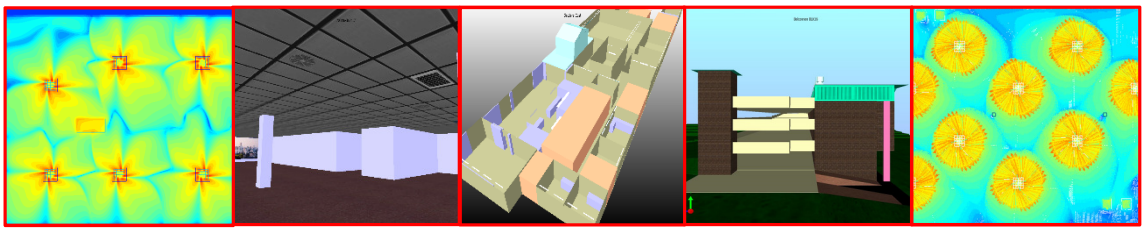
Air Change Effectiveness for Green Star

EMF Griffiths $7 000
ERGON, Rockhampton, QLD

Lucid Engineering $5 000
70 Franklin Street, SA

Wood & Grieve $12 500
Settlers East Community Centre, WA

Northrop $16 000
Belconnen Markets, Building 2 and Block 16, ACT

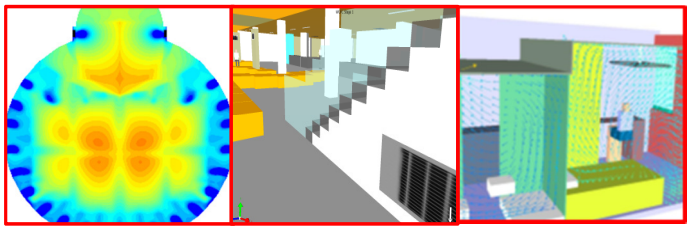


Thermal Comfort

EMF Griffiths $11 000
Brisbane City Hall, QLD

EMF Griffiths $8 500
Winter Garden, QLD

EMF Griffiths $3 500
University of Technology Sydney
Student Accommodation, NSW

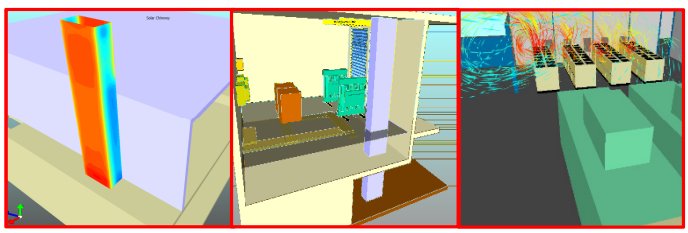


Special Applications

Fratelle Group $2 000
Solar Chimney Design, Burns Beach

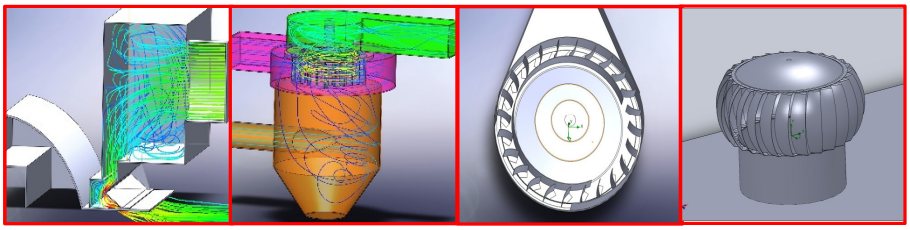
Irwin Consult $1 600
Substation ventilation, NT

Wiley/EMF Griffiths $6 000
ISEEK Chiller Recirculation



Detailed Component Design

ITC Consulting Thorn Light Boot	$2 500
Micronisers Cyclone Separator	$3 000
Wind Energy Technologies Cyclo-Cowl Wind Turbine	$10 000
Green Energy Systems Spheroid Rotor Prototype	$3 000



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