BATUHAN AKBAS

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PROFESSIONAL SUMMARY

Accomplished Thermal and Systems Engineer with 8+ years of experience in aerospace, defense, additive manufacturing, and consumer appliances. Proven expertise in advanced thermal and fluid simulations (1D, CFD, Amesim, Star CCM+, Ansys Fluent, Ansys Discovery), system design, and interdisciplinary collaboration. Skilled in thermal management of complex systems, from concept through validation, applying ARP 4754 and INCOSE system engineering processes. Adept at developing and verifying requirements, leading cross-functional teams, and delivering high-performance, regulatory-compliant solutions.

PROFESSIONAL EXPERIENCE

Nikon SLM Solutions – Senior Model Integration Engineer | Jul 2025 - Present   Lübeck, Germany

- Lead thermal management strategy for industrial additive manufacturing (metal 3D printing, LPBF) machines, focusing on laser, optics, and subsystem cooling with cooling demands ranging from 10 kW to 100 kW.
- Designed and optimized liquid cooling systems (chilled water & glycol mixtures) using heat exchangers, cold plates, and rack cooling manifolds, while ensuring long-term reliability through corrosion and bio growth prevention.
- Engineered complex piping networks, selecting and integrating valves, flow sensors, pressure sensors, and instrumentation for robust and efficient operation.
- Developed heat flow models, P&IDs, and predictive simulations (CFD, FEM via Ansys Discovery) to assess cooling performance and machine reliability.
- Defined and documented system requirements and testing protocols in line with INCOSE system engineering standards utilizing Polarion, supporting design reviews, FMEA, RCA, and supplier integration.

Lilium GmbH - Thermal Systems Engineer | Dec 2022 - Jun 2025   Munich, Germany

- Built 0D/1D ECS models in Amesim to size heating/cooling capacities and evaluate mission profile performance, referencing SAE AIR1168/3A for ECS design guidance.
- Conducted CFD multiphysics simulations (Star CCM+) to optimize windscreen defogging for maximum coverage in minimum time.
- Performed thermal comfort analyses (Star CCM+) using a Fiala-based EHT model to evaluate ventilation strategies and improve cabin airflow distribution.
- Simulated avionics bay cooling and airflow to enhance thermal protection while reducing system pressure drops.
- Supported PDR and CDR phases, contributing to architectural design, requirement management, and safety analysis, aligned with ARP4754A processes.
- Assisted Safety Engineering in FHA activities under ARP4761, ensuring ECS requirements integrated with system-level safety assessments.
- Authored and maintained ECS documentation (FDD, SRD, SDD, ICD, TRD) and prepared validation/verification methods and test documentation in line with requirements.
- Contributed to DO-160G compliance planning for ECS-related avionics and components.

Turkish Aerospace - Thermal Engineer | Dec 2019 - Oct 2022   Ankara, Turkey

- Acted as System Engineer for the Rotor Ice Protection System (RIPS) of the T625 rotorcraft, applying SAE AIR1168/4C standards to ensure compliance with EASA CS-29 regulations.
- Utilized ARP 4754A and ARP 4761 processes through PDR and CDR phases; supported SFHA and FHA activities with the Safety Engineering team and authored the requirements set, architecture definition, and V&V planning for the RIPS.

- Managed requirements using IBM DOORS, ensuring full traceability from system-level requirements to verification and validation activities.
- Prepared system description documents, defined validation and verification means, and coordinated with suppliers to align technical specifications and certification objectives.
- Developed 0D/1D models in Amesim to size the Environmental Control Systems (ECS) of the T625 and T629 helicopters, evaluating heating/cooling capacities and mission performance.
- Performed high-fidelity CFD simulations using StarCCM+ and Python-based automation to optimize the air conditioning unit, ducting, and outlet geometry of helicopter ECS systems.
- Conducted cabin comfort, avionics cooling, and window defogging studies, validating CFD results against full-scale test rigs.
- Simulated flow behavior in fans, blowers, jet pumps, bleed air systems, heaters, and diffusers, leveraging HPC resources to enhance predictive accuracy and design efficiency.
- Mentored a 4 young graduates in CFD simulation, guiding ECS modeling approaches and comparative case studies for T129, T625, and T629 platforms.
- Supported ECS system integration, installation, and test setup for T129, T625, and S-70 Black Hawk, contributing to system-level validation and verification campaigns.

Beko - Thermal Design Engineer | Aug 2017 - Aug 2018   **Ankara, Turkey**

- Performed CFD analyses in Ansys Fluent to reduce pressure losses in hydraulic circuits of dishwashers and improve overall system efficiency.
- Developed and validated CFD models through physical test setups, correlating experimental and numerical results to increase spray performance and flow uniformity.
- Played a key role in designing the innovative "Corner Wash" spray arm mechanism, which enhanced cleaning performance and reduced acoustic noise, later adopted in production models.
- Served as the responsible engineer for new dishwasher models tailored for the Australian market, ensuring compliance with AS/NZS 2007.2:2005 standards and coordinating certification with external laboratories.
- Secured a TÜBİTAK research grant in collaboration with Cukurova University to investigate the use of phase-change materials for improving thermal storage and energy efficiency in dishwashers.

EDUCATION

Middle East Technical University | 2011-2016

Bachelor of Science in Mechanical Engineering

- Senior Project: Design of a Greenhouse Roof Cleaning Robot

Middle East Technical University | 2016-2019

Master of Science in Computer Engineering

- Thesis: Simulation of Laminar Microchannel Flows with Realistic 3D Surface Roughness

SKILLS

- **Simulation & Analysis:** Amesim, Ansys Fluent, Ansys Discovery, OpenFOAM, StarCCM+
- **Programming & Tools:** MATLAB, Python, MS Office, Siemens NX, DOORS IBM, Polarion, Jira
- **Project Management:** Cross-functional collaboration, managing PDR/CDR/TRR phases