

Name MOMOKI Satoru	Job Title Professor	Area of Expertise Thermal Engineering
1. Main Research Topics ① Analysis on Heat Transfer Phenomena by Information Processing of Flow Patterns in Cooling of High Temperature Objects The situation when cooling an extremely hot object with a liquid such as water is complex. Normally, the generated steam covers the surface (heat transfer surface), significantly reducing the cooling performance. Once the temperature of the object has dropped to a certain level, the heat transfer surface becomes wet, and normal boiling occurs, causing intense turbulence between the gas and liquid, resulting in rapid cooling. The purpose of this study is to predict the heat transfer performance in this case and to elucidate the mechanism leading up to the onset of wetting. To quantitatively and accurately understand this phenomenon, it is important to measure the rapidly fluctuating local temperature, but this is not easy. Therefore, we take advantage of the fact that the gas-liquid state is turbulent depending on the heat transfer situation. By combining the results of appropriately processing observation images taken with a high-speed camera using a computer with knowledge of heat transfer phenomena, we are developing a system to obtain heat transfer information from image processing. Examination of feature points in film boiling phenomena images WEB Interface of PROPATH ② Development of program libraries for the thermophysical properties and its usage We are investigating the development and use of PROPATH, a program library that calculates the main thermophysical properties of commonly used fluids such as water, air, and hydrogen - temperature, pressure, density, enthalpy, viscosity coefficient, thermal conductivity, etc. We are focusing on the value of data and how to access it, replacing the use of databases for predicting various physical properties that require different values in various situations.		
2. Keywords Energy, Information Processing, Thermal Engineering, Heat Transfer, Manufacturing		
3. Remarks and Websites This research is characterized by its attempt to quantify the quantities necessary for thermal engineering by utilizing both thermal engineering and information engineering. In recent years, we have begun research into heat transfer phenomena in machining technology and their image processing. Considering the local temperature conditions inside tools and coolants during various special machining processes, we will build a more general "heat transfer model for predicting temperature changes in tools during machining." researchmap: https://researchmap.jp/read0172749 Laboratory:		